NEW YORK CITY DEPARTMENT OF HEALTH AND MENTAL HYGIENE
Ashwin Vasan, MD, PhD
Commissioner

Testimony

of

Corinne Schiff
Deputy Commissioner for Environmental Health
New York City Department of Health and Mental Hygiene

before the

New York City Council Committee on Health
on

Protecting New Yorkers from Heat and Air Quality Emergencies

and

Introductions 1119,1127, 1128,1129 and 1130

September 27th, 2023
New York, NY

Good afternoon, Chair Shulman and members of the Health Committee. I am Corinne Schiff, Deputy Commissioner for Environmental Health at the New York City Department of Health and Mental Hygiene, and I am here with Andrew Faciano, Assistant Commissioner for Environmental Disease and Injury Prevention at the Health Department; Heather Roiter, Deputy Commissioner for Planning and Resilience at NYC Emergency Management; John Shea, Chief Executive Officer of the Department of School Facilities at NYC Public Schools; and Lana Kim, Deputy Commissioner at the Department of Citywide Administrative Services. On behalf of Commissioner Vasan, thank you for the opportunity to testify today on four bills addressing indoor air quality and a bill requiring an annual report on drowning deaths.

The Health Department's charge is to protect and promote the health of all New Yorkers. As relevant to this hearing, we respond to thousands of 311 calls from New Yorkers' each year about their indoor air quality, including by conducting inspections and taking enforcement action against property owners; work with other agencies on indoor air quality issues, including NYC Public Schools, the Departments of Housing Preservation and Development and Environmental Protection, and the School Construction Authority; and provide outreach and education on ways to improve indoor air. We also issue data on causes of death, including by drowning. We appreciate the Council's interest in these issues.

Regarding the indoor air quality bills being discussed today, we would like to work with the Council to ensure efforts to address indoor air quality will result in meaningful outcomes. Two of the bills—Introductions 1128 and 1129—require the Department to conduct studies of indoor air quality by taking air quality measurements at multiple locations within every residential and commercial building that receives city funding. The Department has not yet been able to determine how many buildings this is, but we anticipate this would be a very large and expensive undertaking that would not yield actionable information. The bills require measurement of air quality components that are either already understood and have enforceable standards—so there is no need to study them—or have no health-based standards—and so we would gather information but not be able to use it to address indoor air quality concerns.

The other two air quality bills—Introductions 1127 and 1130—require the Health Department to set standards for indoor air quality in schools and other buildings owned or leased by the City of New York and requires the Health Department and NYC Public Schools to install real time monitors in a variety of locations and issue multiple reports regarding the data collected. For some of the indoor air quality measures, there are already established standards and additional rulemaking is not needed; for others there are no health-based standards, and the Department has no basis on which to promulgate rules. For still others, the conditions vary or are controlled by the occupant of the space and are not generalizable. And while promising, the consumer grade air sensors that are currently available do not meet the stringent requirements for air quality instruments required for regulatory purposes.

The bills also mandate the Department and, for Introduction 1127, NYC Public Schools—to conduct outreach and education on indoor air quality. We agree that we can reevaluate potential outreach efforts to maximize impact. We look forward to working with Council to see what the most effective potential outreach efforts are to maximize impact.

Regarding Introduction 1119, the Department supports providing the public with data on drowning deaths in New York City and already issues information in our Annual Summary of Vital Statistics. We would like to discuss adding the additional information the Council seeks

into this report, rather than creating a duplicative document. We appreciate the recognition in the bill of protecting personally identifying information. We would like to discuss the bill's mandate to report individualized data. Some of the factors we would be required to report raise privacy and confidentiality concerns, but we can provide aggregate data.

Thank you for the opportunity to testify. We are happy to take your questions.

OFFICE OF THE
MANHATTAN
BOROUGH PRESIDENT

1 Centre Street, 19th floor, New York, NY 10007
(212) 669-8300 p (212) 669-4306 f

431 West 125th Street, New York, NY 10027
(212) 531-1609 p (212) 531-4615 f

www.manhattanbp.nyc.gov
Mark Levine, Borough President

MANHATTAN BOROUGH PRESIDENT MARK LEVINE
TESTIMONY BEFORE THE CITY COUNCIL
COMMITTEE ON HEALTH
SEPTEMBER 27, 2023

Good afternoon, Chair Schulman, and members of the Committee on Health. My name is Mark Levine, and I am the Manhattan Borough President. Thank you for the opportunity to testify at today's hearing on protecting New Yorkers from heat and air quality emergencies. There are many valuable topics this hearing is sure to explore, including improving access to swimming and water safety training, increasing the equity of access to cooling centers and pools, and much more. My testimony today will focus on the legislation I am proud to partner with Council Member Powers (Intros 1127, 1128, 1129 and 1130-2023), a bill package to guide New York City on a path toward better ensuring that the air quality in schools, municipal buildings, and commercial and residential spaces is as healthy as possible.

This summer, New Yorkers saw our skies turn from blue to orange and red. Wildfire smoke from Canada reached our city, putting us repeatedly on the list of cities with the worst air quality across the world. This crisis only further elevated an urgent policy need: ensuring our access to clean air. From climate crises like wildfire smoke spread to current and future pandemics, air quality is a vital issue of population health. We have seen throughout the pandemic that the quality of indoor air can greatly impact the level of risk associated with getting sick or exacerbate already existing chronic conditions like asthma and heart disease. Public health and government have prioritized the value of clean air in the past, with healthcare workers prioritizing ventilation for tuberculosis patients over a century ago and DOHMH conducting the New York City Community Air Survey to measure how pollutants like traffic, buildings and more result in differing air quality levels across neighborhoods throughout the city. But little has been done to ensure the public really understands how different pollutants affect our air or how air quality impacts our health and wellbeing. Further, we need to make progress on regulating our indoor air quality and ensuring we have safe refuge from air quality threats. We spend about 90% of our time indoors; to help New Yorkers stay healthy, we need to make sure our buildings are healthy.

That's why I'm proud to be working with Majority Leader Keith Powers, Chairs Schulman, Narcisse, Sanchez and Gennaro on a comprehensive package of legislation to set NYC on a path toward better ensuring healthy air quality in schools, municipal buildings, and commercial and residential spaces. These bills would require the City to publicly post information and data on air quality in the common spaces of these buildings – including temperatures, humidity, and airborne pollutants like carbon dioxide, monoxide, and particle pollution.

This package of bills would also require the City to educate New Yorkers about the importance of clean indoor air, including how to understand real-time air quality data and recommendations on how to improve air quality in our buildings. We also hope this helps guide our work towards

local level regulations around indoor air quality. We see this package as a first step forward while the scientific community continues to improve clean air technologies, and the federal government works to advance national air quality regulations and increase funding to support clean air innovations in localities. We urge the Council to pass these bills this session and establish New York City as a national leader in the fight to address indoor air quality and improve our population health.

We know that our air is a key factor in reducing the risk of spreading disease and mitigating flareups of existing chronic illnesses and disabilities. As we address the current and future climate crises, it is vital that we prioritize the hard work of ensuring that our air is healthy and clean.

OFFICE OF THE BROOKLYN BOROUGH PRESIDENT

ANTONIO REYNOSO
Brooklyn Borough President

City Council Committee on Health
Oversight Hearing: Protecting New Yorkers from Heat and Air Quality Emergencies
9.27.23

Good afternoon Chair Schulman and thank you for holding this hearing today. My name is Lacey Tauber and I am Legislative Director for Brooklyn Borough President Antonio Reynoso.

While the extreme heat and air quality emergencies our city experienced this summer impacted everyone, the fact is that low-income New Yorkers of color disproportionately experience the impacts of climate change on a daily basis. Rather than focusing on how we can respond to emergencies, we should be focusing on how we can protect vulnerable populations long-term, which will in turn make us more prepared when emergencies happen.

Our office is in the final stages of developing the Comprehensive Plan for Brooklyn, with a focus on the intersection of planning, housing, and public health. A few illustrative maps from our existing conditions research are attached showing air quality and heat impacts in the borough.

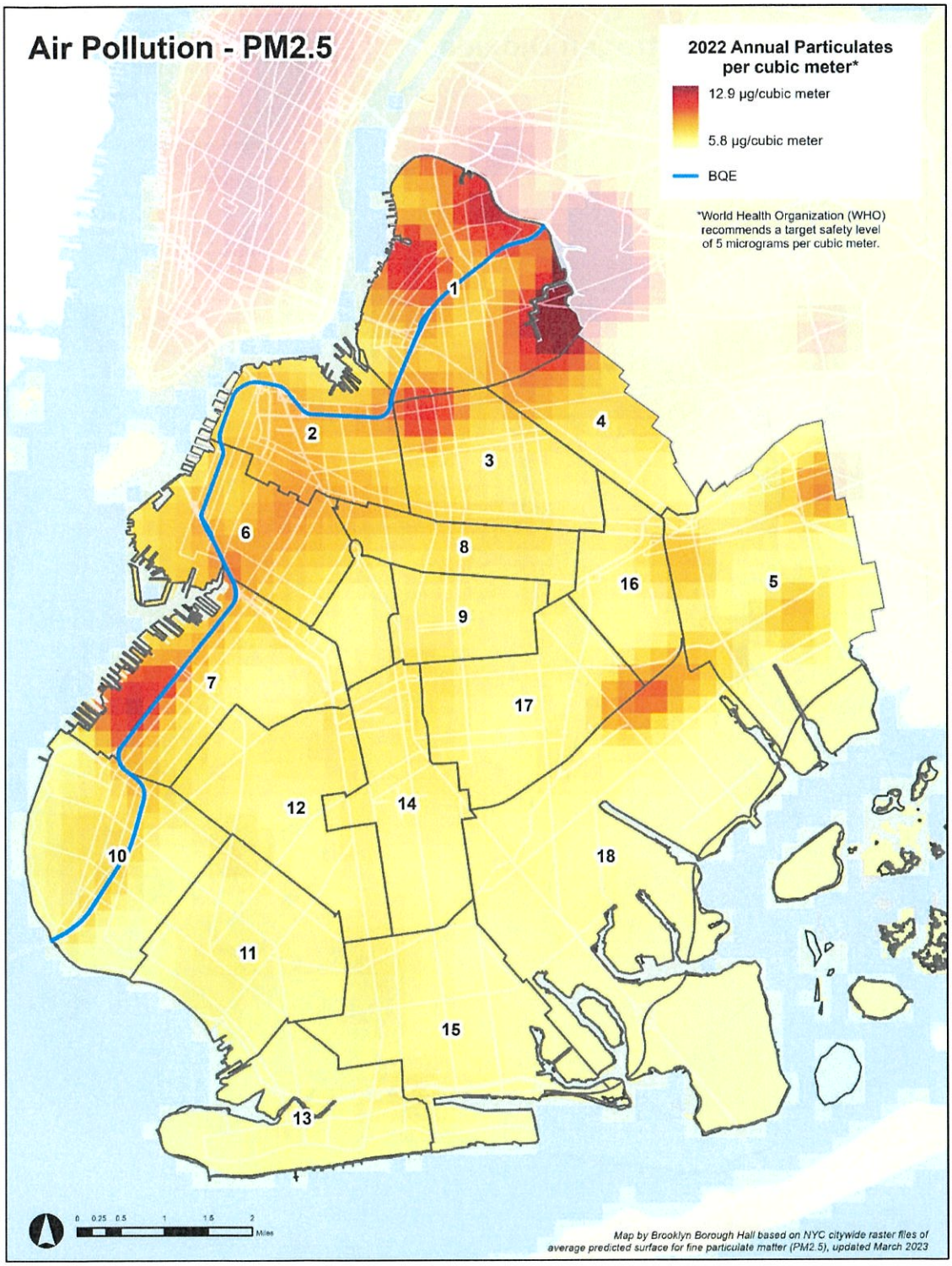
You can see that outdoor air quality is worse on average surrounding highway corridors such as the Brooklyn-Queens Expressway, which runs through neighborhoods of color such as Sunset Park and Williamsburg's Southside. The maps also indicate a correlation between asthma rates and indoor air quality issues, as well as associated conditions such as mold and asbestos. Asthma rates and concentration of these complaints are highest in neighborhoods of color in North, Central, and Eastern Brooklyn, such as Brownsville, Flatbush, East New York, and Bushwick. Heat vulnerability data tells a similar story. Per DOHMH's metric, these are also the communities that are more at risk of dying during and immediately following extreme heat.

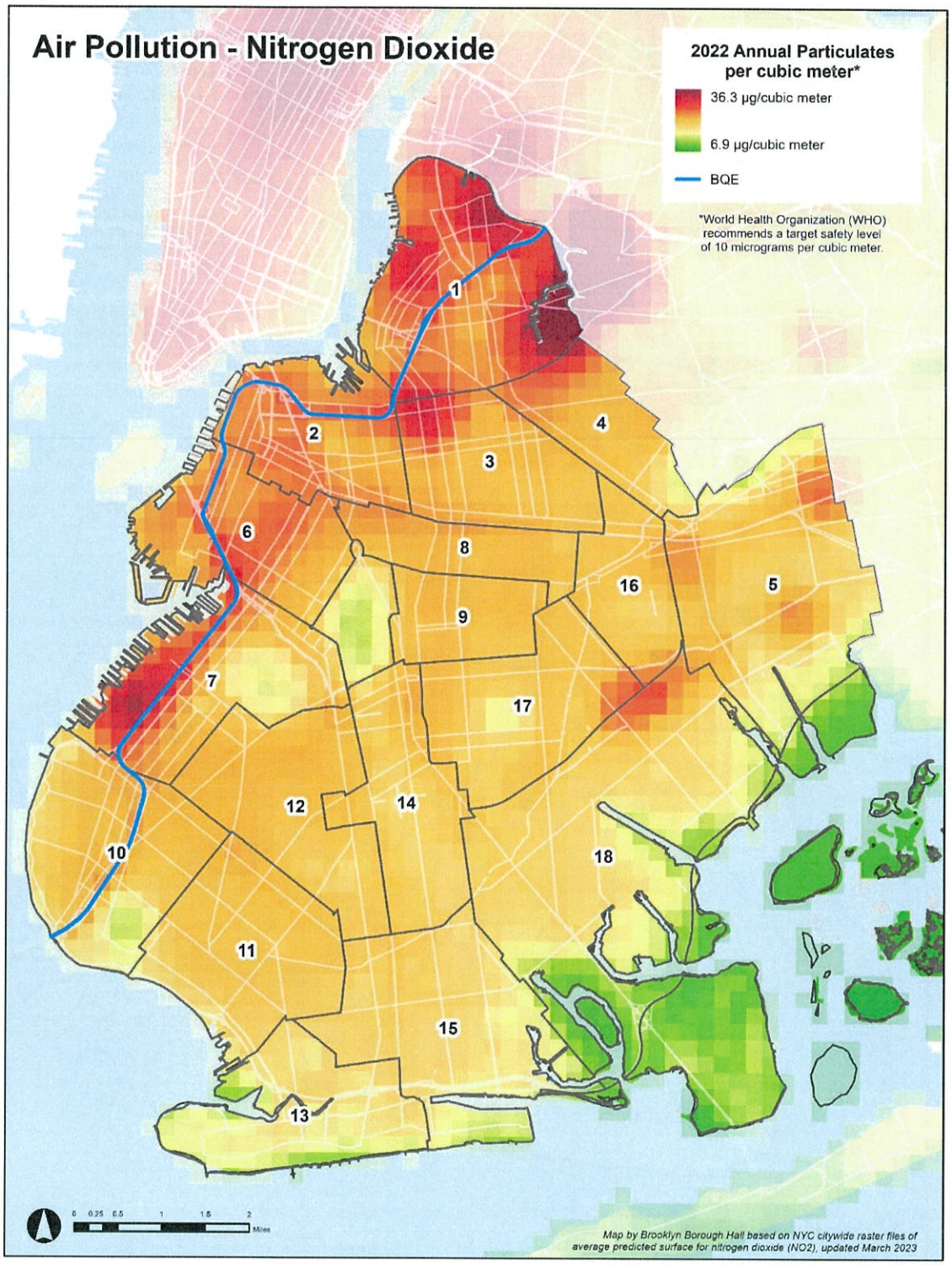
The repetition of these patterns is no coincidence; rather, it is a symptom of decades of bad planning and disinvestment from our communities of color and our public housing. The Comprehensive Plan for Brooklyn makes recommendations for how we can begin to right these wrongs through proactive planning for a more equitable borough. Some of the Plan's recommendations around air quality and heat include:

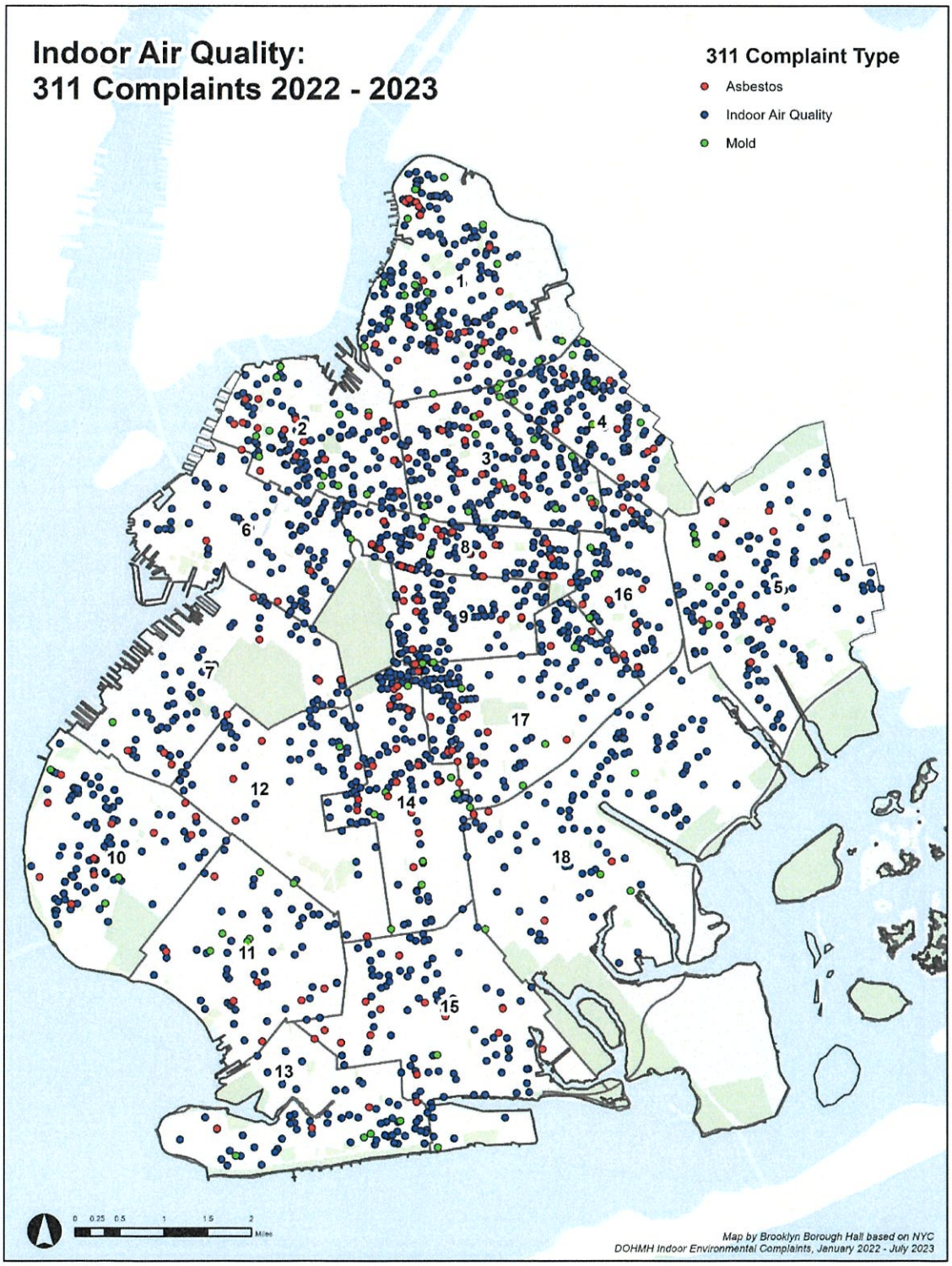
- Create a new Million Trees program to improve the tree canopy, targeted to areas of high air pollution and heat vulnerability.
- Support the package of indoor air quality bills being heard today from Councilmember Bottcher and Borough President Levine, whom we commend for a creative approach to a difficult issue.
- Advocate for capital repairs and more efficient responses to tenant complaints in public housing.

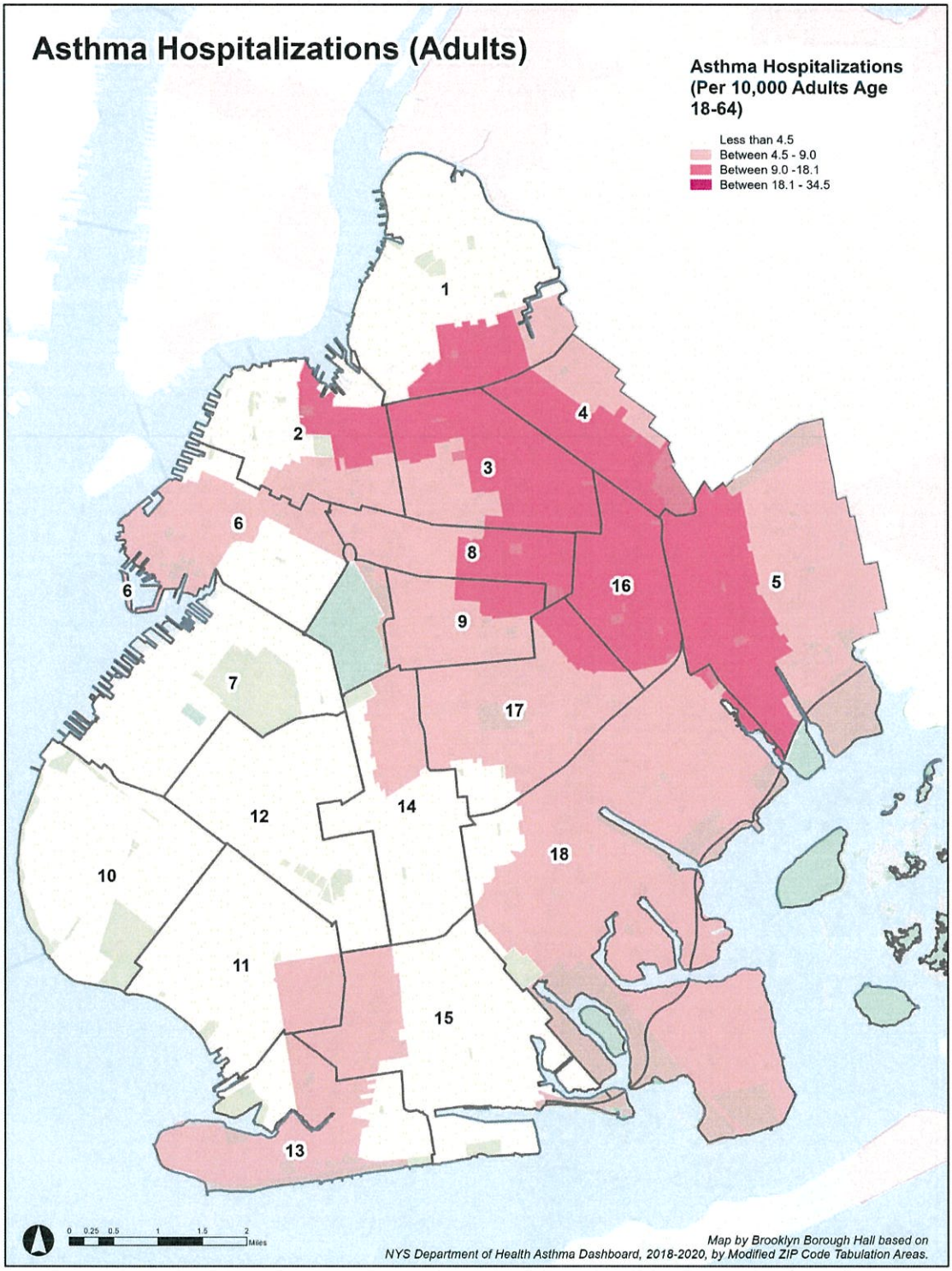
- Expand access to cooling centers, with a lower threshold for opening.
- Require new development to implement cooling systems, such as air conditioning or more sustainable methods like air source heat pumps, passive house design, and cool or green roofs.
- Require developers to include window shades or blinds in new construction, and require NYCHA and all private landlords in high heat vulnerability areas to install window shades or blinds for tenants who request them.
- Improve inter-agency and community coordination.
    - Our office is currently convening a Community Advisory Group for the Department of Environmental Protection's Community Air Monitoring Initiative. This is only one of many efforts to monitor air quality in the borough, and we are encouraging DEC to incorporate past community-scale efforts, and to proactively work with other State and City agencies – especially Departments of Transportation – as we begin to develop mitigation strategies.
    - The fact that NYCHA threatened to have tenants evicted if they did not pay for air conditioning provided through a "free" Mayor's Office program –a program that an academic study showed literally saved lives – is unacceptable. While they have extended their deadline for charging tenants for this program, what happens on October 1st? DOHMH or the Mayor's Office should once again intervene to ensure that vulnerable residents can maintain free a/c access.

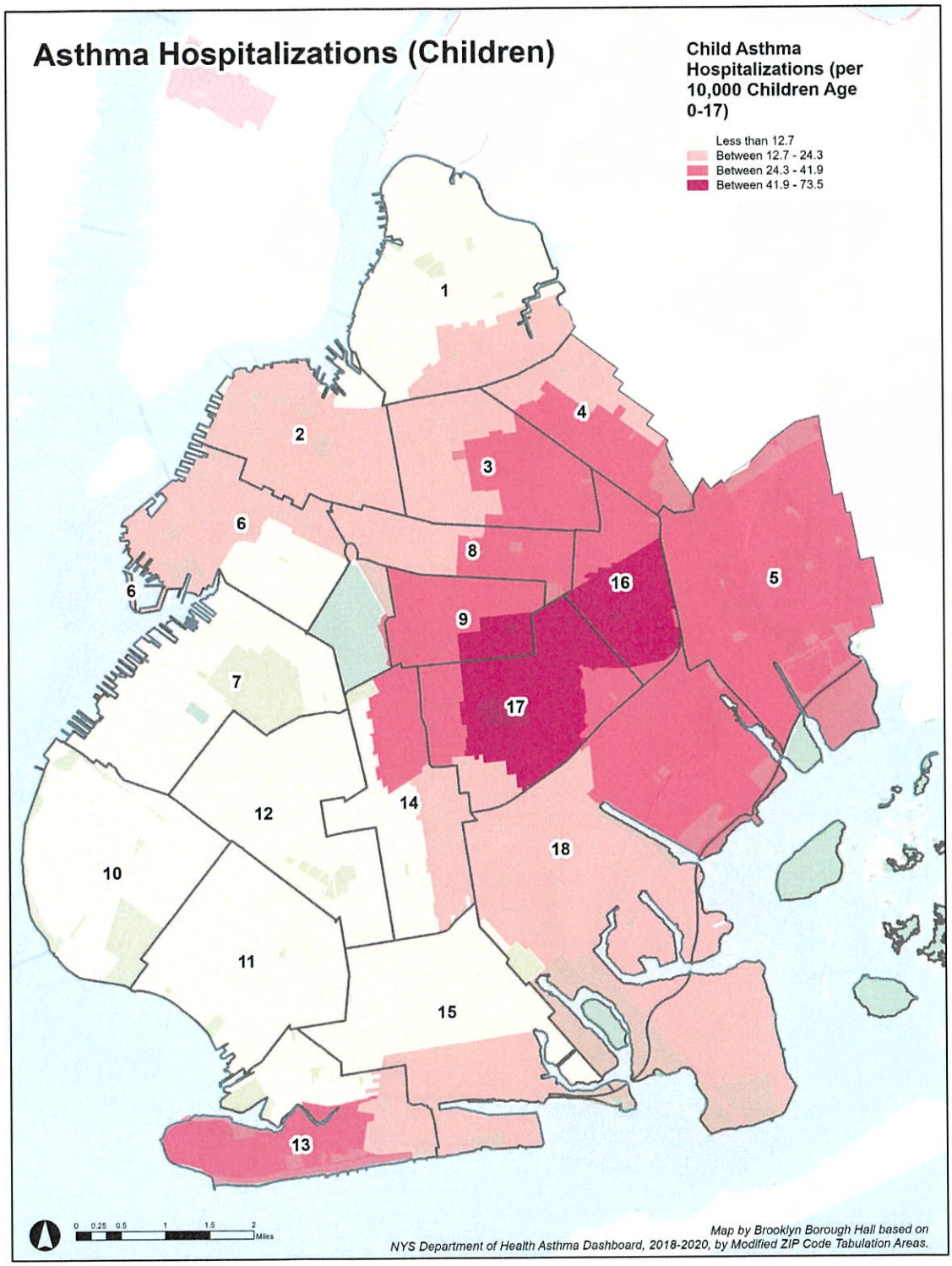
These are just some examples of our recommendations, and we look forward to sharing the full report with the City Council very soon. Thank you again for the opportunity to testify today.

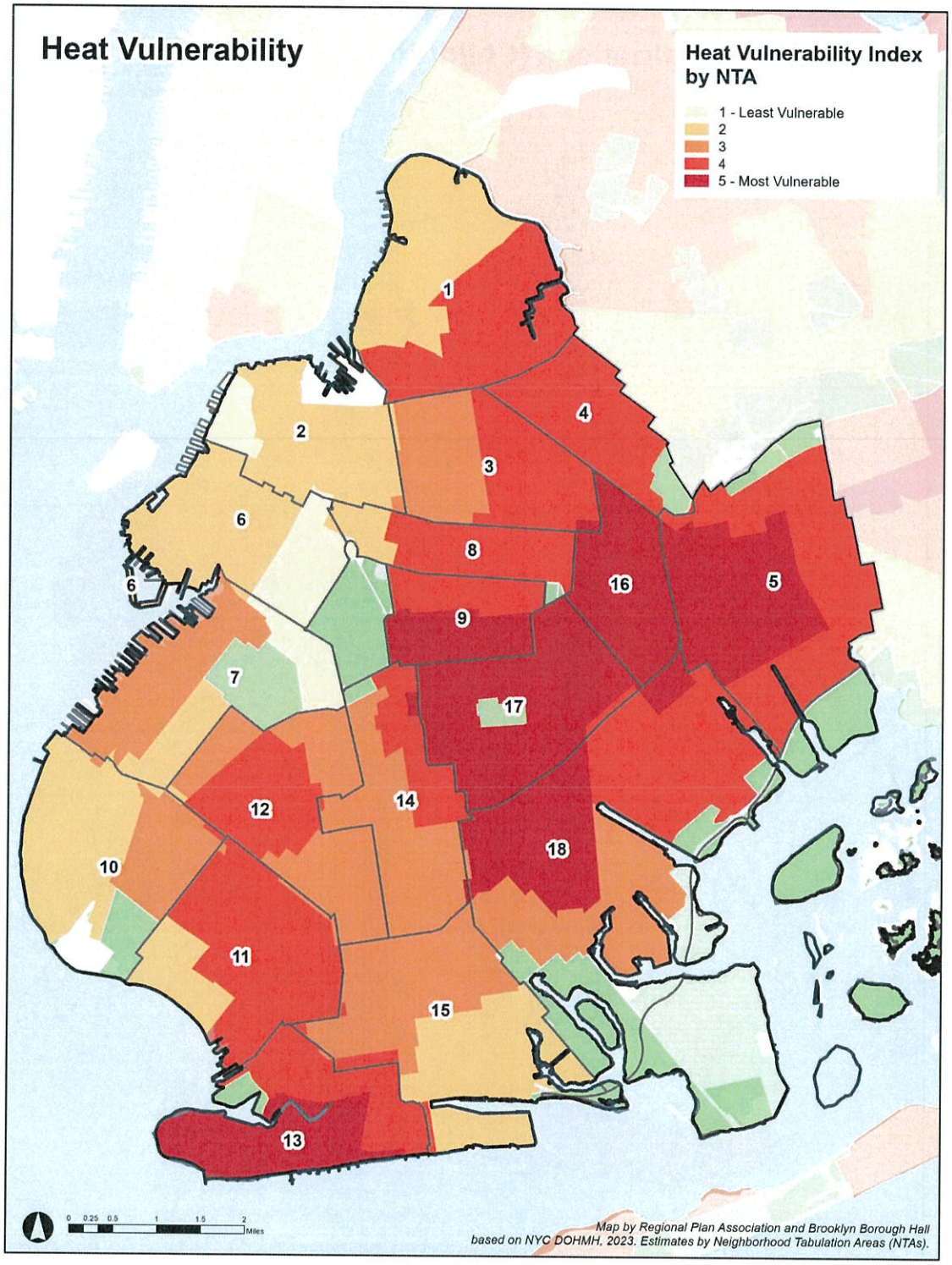

Air Pollution - PM2.5
2022 Annual Particulates per cubic meter*
12.9 µg/cubic meter
5.8 µg/cubic meter
BQE
*World Health Organization (WHO) recommends a target safety level of 5 micrograms per cubic meter.
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
0 0.25 0.5 1 1.5 2
Miles
Map by Brooklyn Borough Hall based on NYC citywide raster files of average predicted surface for fine particulate matter (PM2.5), updated March 2023

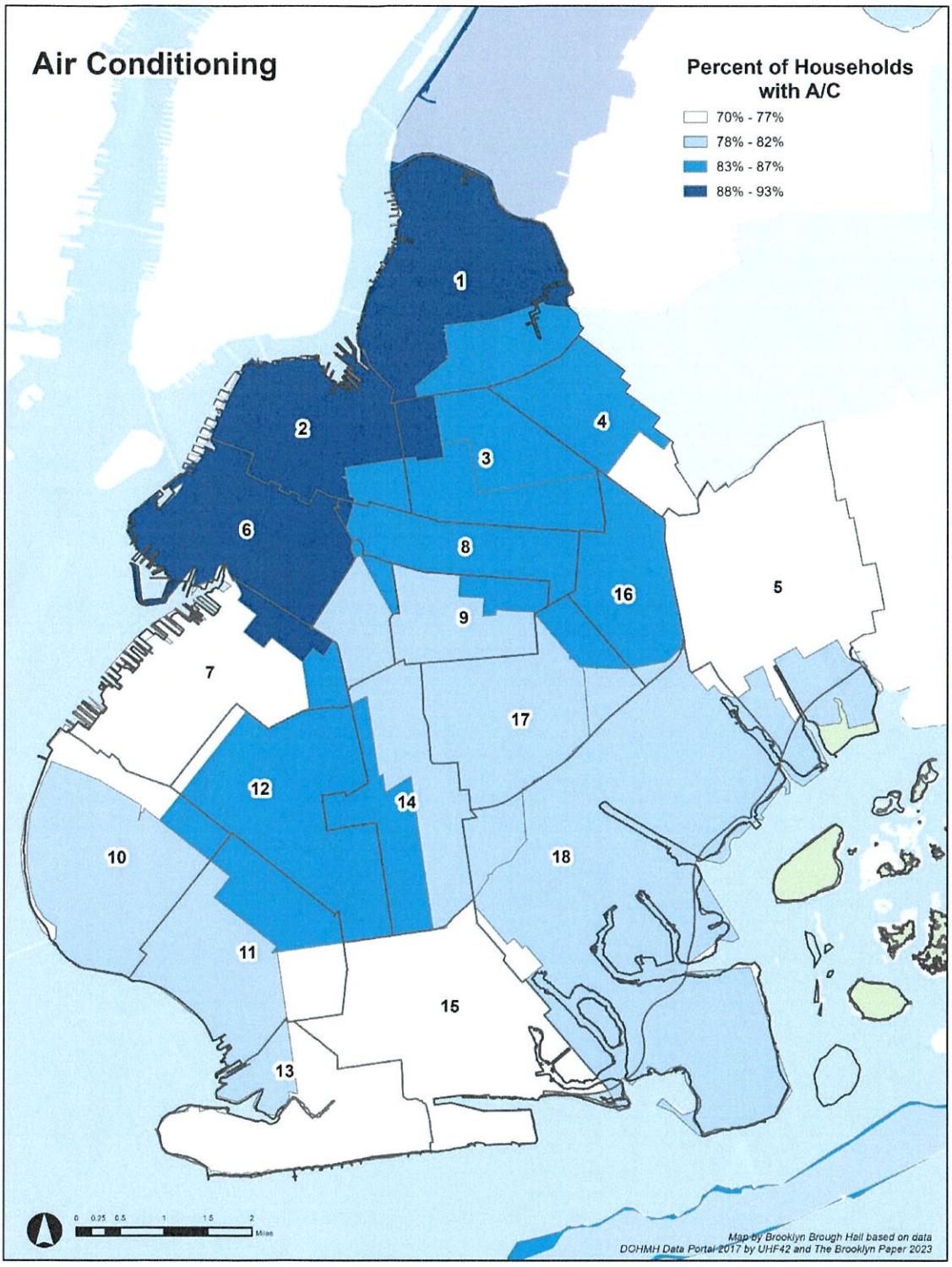

Air Pollution - Nitrogen Dioxide
2022 Annual Particulates per cubic meter*
36.3 µg/cubic meter
6.9 µg/cubic meter
BQE
*World Health Organization (WHO) recommends a target safety level of 10 micrograms per cubic meter.
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
0 0.25 0.5 1 1.5 2
Miles
Map by Brooklyn Borough Hall based on NYC citywide raster files of average predicted surface for nitrogen dioxide (NO2), updated March 2023


Indoor Air Quality:
311 Complaints 2022 - 2023
311 Complaint Type
Asbestos
Indoor Air Quality
Mold
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
0 0.25 0.5 1 1.5 2
Miles
Map by Brooklyn Borough Hall based on NYC
DOHMH Indoor Environmental Complaints, January 2022 - July 2023


Asthma Hospitalizations (Adults)
Asthma Hospitalizations (Per 10,000 Adults Age 18-64)
Less than 4.5
Between 4.5 - 9.0
Between 9.0 -18.1
Between 18.1 - 34.5
1
2
3
4
5
6
6
7
8
9
10
11
12
13
14
15
16
17
18
0 0.25 0.5 1 1.5 2 Miles
Map by Brooklyn Borough Hall based on
NYS Department of Health Asthma Dashboard, 2018-2020, by Modified ZIP Code Tabulation Areas.


Asthma Hospitalizations (Children)
Child Asthma Hospitalizations (per 10,000 Children Age 0-17)
Less than 12.7
Between 12.7 - 24.3
Between 24.3 - 41.9
Between 41.9 - 73.5
1
2
3
4
5
6
6
7
8
9
10
11
12
13
14
15
16
17
18
0 0.25 0.5 1 1.5 2 Miles
Map by Brooklyn Borough Hall based on
NYS Department of Health Asthma Dashboard, 2018-2020, by Modified ZIP Code Tabulation Areas.


Heat Vulnerability
Heat Vulnerability Index by NTA
1 - Least Vulnerable
2
3
4
5 - Most Vulnerable
1
2
3
4
5
6
6
7
8
9
10
11
12
13
14
15
16
17
18
0 0.25 0.5 1 1.5 2
Miles
Map by Regional Plan Association and Brooklyn Borough Hall
based on NYC DOHMH, 2023. Estimates by Neighborhood Tabulation Areas (NTAs).


Air Conditioning
Percent of Households with A/C
70% - 77%
78% - 82%
83% - 87%
88% - 93%
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
0 0.25 0.5 1 1.5 2
Miles
Map by Brooklyn Brough Hall based on data
DOHMH Data Portal 2017 by UHF42 and The Brooklyn Paper 2023

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Office of Climate, Air, & Energy, Deputy Commissioner
625 Broadway, 14th Floor, Albany, New York 12233-1010
P: (518) 402-2794 | F: (518) 402-9016
www.dec.ny.gov

Testimony of Jonathan Binder, Deputy Commissioner for Air Resources, Climate Change, and Energy, New York State Department of Environmental Conservation, to the New York City Council Committee on Health Hearing on Oversight - Protecting New Yorkers from Heat and Air Quality Emergencies

September 26, 2023

Thank you for your continued attention and partnership on protecting air quality in New York State and the City of New York. The New York State Department of Environmental Conservation (DEC) takes great pride in implementing rigorous, science-based air quality monitoring statewide, and coordinating with the New York State Department of Health (DOH) to transparently share comprehensive forecasts with federal, state, and local partners, providing important health-related information so that all New Yorkers, especially those most at risk from poor air quality, have the information necessary to take appropriate precautions.

In the wake of air quality episodes due to smoke from Canadian wildfires in early June, the July 12 New York City Council Hearing and the New York City Public Advocate's report on the City's response to the June episodes, DEC is sharing the following information regarding our expert air quality forecasting methodology, particularly how the DEC Division of Air Resources' Impact Assessment and Meteorology Section prepares and issues daily air quality forecasts and Air Quality Health Advisories. This information is intended to help your offices better understand the State's processes and protocols for developing and sharing air quality forecasts and corresponding health Advisories and serve to clarify any misconceptions regarding this essential work.

Over several decades, DEC has established the nation's premier air quality monitoring network, with 54 stationary, U.S. Environmental Protection Agency-(EPA) approved monitors that sample for a suite of potential air quality impairments. These monitors provide data for required reporting to EPA, as well as data for DEC and other meteorologists to inform their forecasts. Unlike commercial monitors available to the general public, DEC's monitors are tested annually to confirm the validity of data provided according to strict federal standards.

DEC's monitors provide data for effective air quality monitoring and forecasting. When millions of New Yorkers access EPA's Airnow app or web-based interface (Airnow.gov), they are looking at air pollution readings captured by DEC monitors. In addition, DEC forecasts use the best available science and validated data to assess current conditions and forecast anticipated conditions. DEC uses this data and the forecasting expertise of

its dedicated staff to issue Air Quality Health Advisories in coordination with DOH prior to air quality events anticipated to impact the health of New Yorkers.

Air Quality Forecasts: Ozone & PM2.5

DEC air pollution meteorologists prepare daily Air Quality Index (AQI) forecasts for New York State. DEC forecasts for fine particulate matter (PM2.5) year-round, and forecasts for ground-level ozone as a seasonal pollutant from April through September. During the ozone season, DEC meteorologists participate in a daily forecasters' call at 2:00 p.m. with other Northeast States and EPA. DEC provides the AQI forecast by approximately 3:00 p.m. for the following day. DEC posts the forecast on our website (https://www.dec.ny.gov/cfmx/extapps/aqi/aqi_forecast.cfm) and EPA's Airnow.gov site https://www.Airnow.gov), and shares the forecast via a recorded message on DEC's AQI Hotline (800-535-1345). Each morning, DEC forecasters review the latest information and data to determine if conditions warrant an updated forecast. In the event an update is needed, DEC posts and issues the updated forecast by approximately 10 a.m. for that day.

DEC fulfills a role much like our colleagues at the California Air Resources Board, and under the federal Clean Air Act, New York State DEC is the delegated agency charged with monitoring and regulating air pollution from all potential sources statewide, including monitoring wildfire smoke enhanced PM2.5.

For more than 50 years, federal and state air pollution programs have worked to control emissions of criteria pollutants and toxic air contaminants from facilities through regulations, permits, and technical requirements, as well as programs like the Vehicle Inspection and Maintenance Program, which checks vehicle emissions and requires repairs to failed pollution control equipment. New York State is also advancing efforts to reduce vehicle emissions above and beyond current federal requirements, including by adopting California's stricter standards. DEC tracks the impacts of these and other programs with extensive measurement and monitoring of ambient pollutant levels. Federal law requires DEC to periodically submit State Implementation Plans (SIPs) that demonstrate how state air pollution control programs are working to attain National Ambient Air Quality Standards (NAAQS). Under the federal Clean Air Act, EPA sets NAAQS for six principal pollutants, known as "criteria pollutants," including PM and Ozone.

24-Hour vs. Hourly AQI Values

AQI forecasts are based on the format of the federal NAAQS. The NAAQS for PM2.5, the pollutant driven by the Canadian wildfires this summer, is a 24-hour average. The NAAQS for ozone is an 8-hour average value. Each day, DEC forecasts the 24-hour AQI for PM2.5 and the highest 8-hour daily AQI value for ozone. Although Airnow.gov and other weather websites and apps provide temporary, hourly AQI values for public awareness in addition to the daily forecast, these hourly concentrations may represent temporary spikes in values, and show levels higher than the forecasted daily AQI.

Currently, the PM2.5 24-hour NAAQS is 35 µg/m^3. If DEC meteorologists forecast a 24-hour PM2.5 average greater than this concentration at a location in New York State, which corresponds to an AQI value greater than 100, New York State agencies issue an Air Quality Health Advisory for that specific region.

Currently, the ozone 8-hour NAAQS is 0.070 ppm. If DEC meteorologists forecast a maximum 8-hour ozone concentration greater than this value for a particular New York region, which corresponds to an AQI value greater than 100, DEC and DOH will issue an Air Quality Health Advisory for ozone in that region.

Federal AQI health guidelines are associated with recommendations to protect impacted populations. The following AQI categories describe different concern levels and related messaging for both PM2.5 and ozone. For each pollutant, an AQI value of 100 corresponds to an ambient air concentration that equals the level of the short-term national ambient air quality standard for protection of public health. When AQI values are forecast to be above 100, air quality is categorized as unhealthy: at first for certain sensitive groups of people, then for everyone as AQI values get higher.

- 0-50: Good **(Green)** – Air quality is considered satisfactory and air pollution poses little or no risk.
- 51-100: Moderate **(Yellow)** – Air quality is acceptable. However, for some pollutants there may be a moderate health concern for a very small number of people who are unusually sensitive to air pollution.
- 101-150: Unhealthy for Sensitive Groups **(Orange)** – Members of sensitive groups may experience health effects. The general public is not likely to be affected. *Sensitive groups include people with asthma, heart or lung disease, older adults, children and teenagers, minority populations, and outdoor workers.*
- 151-200: Unhealthy **(Red)** – Everyone may begin to experience health effects. Members of sensitive groups may experience more serious health effects.
- 201-300: Very Unhealthy **(Purple)** – Health alert. Everyone may experience more serious health effects.
- 301-500: Hazardous **(Maroon)** – Health warnings of emergency conditions. The entire population is more likely to be affected.

For more information about AQI, visit the EPA website, Airnow.gov.

Air Quality Health Advisories

When the AQI is expected to be above 100 for either PM2.5 or ozone, DEC and DOH issue an Air Quality Health Advisory. The advisory indicates the pollutant of concern, forecasted AQI level, and the affected region or regions. Prior to issuing an advisory, DEC will have already briefed other Northeast states and EPA on the 2 p.m. daily forecasters' call. In addition to these efforts, when DEC issues an Air Quality Health Advisory with DOH colleagues, DEC coordinates with agency partners including the Division of Homeland Security and Emergency Services (DHSES). DEC works with DHSES to provide relevant information and updates to local emergency managers to

ensure consistent statewide messaging about an air quality event and provide any locally tailored messaging to protect public health.

To reach a broader public audience, DEC issues a press release to media outlets statewide, posts on the agency's social media channels, distributes automated messages via its Listserv, and sends the advisory to National Weather Service regional offices to include on their websites. As noted previously, DEC posts the forecast to the DEC website and records a message for the AQI telephone hotline.

DEC enhanced these efforts in early June 2023, sending additional information including an AQI forecast discussion and extended outlook, to our federal, state, and local partners, including EPA, the National Weather Service, NYC Emergency Management Department, and many others. In addition, DEC participates in NYC EM Interagency Planning when elevated AQI values are forecasted.

As recognized by New York City Emergency Management Commissioner Zach Iscol on July 12, developing a forecast of air pollutant concentrations is a complex task that requires more expertise than general weather forecasting. DEC air quality forecasters start by evaluating the large synoptic-scale weather patterns and vertical profile of the atmosphere, including surface and upper air temperatures, wind speeds and directions, and cloud cover and precipitation, among other parameters. Forecasters also look at the hourly data from air quality monitors to determine the current concentrations and extent of pollutants in the air near ground-level. Hourly data from air monitoring networks across North America provides air quality forecasters with useful real-time information. For example, smoke plumes are often visible on satellite images during wildfire season. However, some of these plumes are confined to a narrow band thousands of feet above the ground, with no adverse impacts on the health of New York State residents. This has often been the case with many of the wildfires in western states and Canadian provinces in recent years, which created a visible haze in the upper atmosphere but had limited impacts at ground level in New York State.

While there are many national and international weather forecasting models available to assist meteorologists, there are relatively few air quality forecast models. Many of the available ozone and PM2.5 forecast models have a high degree of uncertainty for extended, 48-hour forecasts. Air quality models are highly complex and incorporate atmospheric chemistry with weather forecast data to determine the transport of pollutants through the air. While researchers are developing new air quality models, the validity of the air quality forecast output needs to undergo extensive scientific review prior to a model's use in an operational setting. To ensure DEC has the most up-to-date tools to assist with the State's forecasting, DEC actively engages with researchers and academic institutions.

June 5-9 Canadian Wildfire Air Quality Event
For the entirety of the Canadian wildfire air quality event in June and subsequent events, DEC closely monitored air quality conditions in real time and, in partnership with our colleagues at DOH, communicated to our state, federal, and city partners and the public about the need to take safety precautions due to smoke from Canadian wildfires.

On June 1, DEC and DOH issued an Air Quality Health Advisory for ozone in the Western New York, Eastern Lake Ontario, and New York City Metro regions, and advised the elevated ozone values were due to several factors, including Canadian wildfires. On June 2, DEC announced it was deploying personnel—the first of several crews—to assist with efforts to contain the Canadian wildfires and included information on DEC's monitoring of smoke from the wildfires.

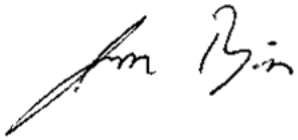
On June 5, DEC and DOH issued an Air Quality Health Advisory for particulate matter for the Adirondacks, Eastern Lake Ontario, Central New York, and Western New York regions as smoke entered the state. This was the first day particulate matter in the air was concentrated at levels that would trigger an Air Quality Health Advisory—when forecasters first predicted an Air Quality Index value of 100 or more due to wildfire smoke.

Between June 5 and June 8, DEC and DOH issued daily Air Quality Health Advisories reflecting changing conditions across the state, including in the New York City Metro region. During this week, DEC continued to communicate daily with our state partners, as well as NYC Emergency Management Department colleagues, the National Weather Service, EPA and others. In addition, Governor Hochul and the DEC, DOH, and DHSES commissioners hosted multiple media availabilities and press events, distributed daily statements, press releases, and social media posts to keep the public informed.

Unprecedented smoke from wildfires across Canada this year provide a sobering reminder of the advancing impacts of our changing climate. DEC will continue to work to provide the best possible information and air quality forecasts to our partners in New York City and across the state and work to ensure that the information our experts provide is accurate, timely, and actionable.

DEC thanks the New York City Council Committee on Health for the opportunity to submit testimony on this critical topic and looks forward to continuing to work collaboratively to protect New Yorkers.

Sincerely,



Jonathan Binder
Deputy Commissioner

Testimony of Alia Soomro, Deputy Director for New York City Policy
New York League of Conservation Voters
City Council Committee on Health
Oversight Hearing – Protecting New Yorkers from Heat and Air Quality Emergencies
September 27th, 2023

My name is Alia Soomro and I am the Deputy Director for New York City Policy at the New York League of Conservation Voters (NYLCV). NYLCV is a statewide environmental advocacy organization representing over 30,000 members in New York City. Thank you, Chair Schulman and members of the Committee on Health for the opportunity to testify.

One of NYLCV's top priorities is fighting for clean air—whether the source is toxic fossil fuels from our power, transportation, or building sectors, or wildfire smoke due to climate change. For decades, low income and communities of color have faced the brunt of toxic air pollution due to environmental racism and historic disinvestment. Because of the neglect these communities have faced, New York City has one of the country's highest rates of asthma hospitalizations and deaths among children, young adults, African American and Latino residents, and residents of high-poverty neighborhoods.

On top of this, climate change is already exacerbating existing social, environmental, economic, and public health disparities. For example, New Yorkers faced a week of poor air quality when wildfire smoke from Canada blanketed our skies earlier this summer. Data from the City's Department of Health and Mental Hygiene (DOHMH) exemplified this trend in the days surrounding June 7th when New York City ZIP codes with the highest numbers of asthma-related emergency room visits were disproportionately in low-income, predominantly Black and Hispanic communities.

As our planet experienced record-breaking heat this summer, coupled with the fact that recent reports have indicated that wildfire smoke is rolling back progress on the Clean Air Act, New York must continue working to reduce poor air quality and mitigate its harmful impacts. NYLCV believes that Intros 1127, 1128, 1129, and 1130, bills introduced by Council Member Powers at the request of Manhattan Borough President Levine and that will increase indoor air quality monitoring throughout the City, are timely and necessary to improve the health of all New Yorkers, combat the impacts of climate change, and further environmental justice. We are excited that these bills align with the Administration's goals contained in *PlaNYC: Getting Sustainability Done*, which includes developing a new air quality monitoring program by 2024 as a priority.

NYLCV appreciates that these bills not only begin pilot programs for indoor air quality monitoring and data collection but will also develop recommendations for permanent standards in our City's schools, City-owned buildings, and certain residential and commercial buildings. Monitoring indoor air quality is necessary not only to prepare our City for future climate impacts such as wildfire smoke, but to identify hyper-local sources of air pollution, and protect vulnerable populations. As previously mentioned, asthma hospitalizations are particularly high among Black and Latino residents and residents of high poverty neighborhoods. Due to this fact, we underscore that the pilot programs being proposed must be equitably implemented across diverse geographic areas, with variations in income, race, and ethnicity. Failure to diversify the pilot programs could negatively affect the data collected, conclusions, and recommendations made after the 5 year pilot period ends.

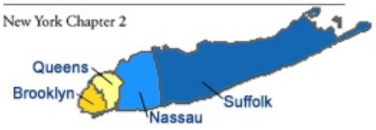
Moreover, asthma is one of the top reasons for school absenteeism in elementary and middle schools—and the most common reason that children are hospitalized. Intro 1127, requiring DOHMH to develop standards regarding indoor air quality in schools, reporting on DOE's website, and the installation and maintenance of air quality monitoring devices, is a necessary step to ensure students are in the classroom and not in the hospital. Because air quality can affect each school differently, and because access to information looks different for each family, ensuring the direct reporting of indoor air quality to families is a necessary addition to this pilot program. We recommend that this bill require outreach materials to be translated into commonly used languages in New York City to maximize the information parents and guardians have access to. When air quality in a school reaches levels of concern in any regard, it is vital that families are directly informed in order to take the necessary steps at home for the health of their students.

As wildfires and subsequent air quality emergencies become more frequent and as our planet continues to warm, it is imperative that the City take comprehensive short- and long-term steps to improve our preparedness and protect New Yorker's health. NYLCV underscores the recommendations outlined in our July 12, 2023 testimony, such as utilizing the recommendations contained on the CDC's website and the CDC's Wildfire Smoke Guide for Public Health Officials, improving the notification and timing of air quality and heat emergency alerts, opening clean air and cooling centers during emergencies, and more. Lastly, if these bills are approved, it is vital that the pilot programs outlined above receive appropriate funding to ensure its effectiveness, especially in the face of citywide budget cuts.

The indoor air quality monitoring pilot programs being considered today are a meaningful and necessary start and NYLCV looks forward to working with the City Council, Manhattan Borough President, and Administration to ensure its success.

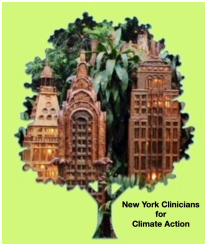
Thank you for the opportunity to testify.

American Academy of Pediatrics
DEDICATED TO THE HEALTH OF ALL CHILDREN®
New York Chapter 2



NYS AAP–Chapter 3
INCORPORATED IN NEW YORK

American Academy of Pediatrics
DEDICATED TO THE HEALTH OF ALL CHILDREN®



DATE: September 28, 2023

Subject: Proposed bills for indoor air quality: Int 1127-2023; Int 1128-2023; Int 1129-2023; Int 1130-2023

Dear Chairperson Schulman and Council Member Powers,

Thank you for the opportunity to provide input on the proposed bills (#1127, #1128, #1129, #1130) that aim to improve and standardize indoor air quality in schools, residential and municipal buildings and establish pilot programs to monitor indoor air quality in schools, residential, and commercial buildings.

These comments on the proposed bills are submitted on behalf of Chapters 2 and 3 of the New York State American Academy of Pediatrics, encompassing all of New York City, and New York Clinicians for Climate Action, a statewide clinicians environmental organization working to create a healthier environment for all New Yorkers. These organizations have expertise in the area of environmental health, health care, and especially pediatrics.

We believe that these bills present an opportunity to address an area of environmental health that has not received much attention and substantially impacts the health and well-being of children and New Yorkers. These bills can set an example for communities across the state, and indeed, across the country and our organizations support these measures that have great potential to decrease illness, suffering, absenteeism, and even save money for the city and state.

New York City is leading the way to better indoor air, with major benefits for city residents. Little guidance is available in the US to understand health risks indoors, and even less policy exists to regulate indoor air pollutants. With the proposal of these bills, New York City sets a leading example for cities across the US who are seeking to protect indoor spaces and their communities. Protecting indoor air quality and lowering pollutant levels has the potential to limit outbreaks, reduce exposure to health-harming toxins and pollutants, safeguard against environmental hazards like wildfire smoke, lower risk of respiratory conditions like childhood asthma, improve learning performance and decrease absenteeism from school and work, and protect particularly susceptible groups like children, elderly, and disadvantaged communities.

Indoor air quality impacts health and safety. Indoor air pollution has been consistently ranked as one of the top five environmental risks to public health in the US by the EPA. The average American spends about 90% of their time indoors where some pollutant levels are two to five times higher than typical outdoor levels. Some pollutant levels may be even higher in homes that use combustion appliances. Exposure to indoor air pollution can contribute to respiratory issues, hospital visits, absences from school and work, and serious conditions like heart disease, stroke, and cancer. In addition to causing health impacts, indoor air pollution may make existing health conditions worse, like asthma.

Indoor air pollution does not affect everyone equally. Sensitive groups, like children, the elderly, and disadvantaged communities are all at a higher health risk from indoor air pollution. Low-income

households tend to experience poorer indoor air quality and live in homes that are smaller, less well-ventilated, contain aging, less-efficient appliances, and are closer to outdoor air pollution sources, all of which lead to higher indoor pollutant concentrations. It is important to prioritize indoor air quality solutions for these communities.

Indoor air pollution threatens all building types, necessitating protective measures like standards and pilot programs. Exposure to indoor air pollution can contribute to an array of negative health impacts, from exacerbating existing conditions like asthma to contributing to increased hospital visits and serious conditions like heart disease, stroke, and cancer. These risks may be higher for sensitive groups like children and the elderly, for low-income communities, and for households with combustion appliances.

Indoor Air Quality in Schools
The proposed standard for indoor air quality in schools outlined in bill #1127 will protect student health. Healthy indoor air is crucial for school buildings, where students spend about 1,000 hours per year and where conditions influence childhood health and educational attainment, impacting lifelong outcomes in health, life expectancy, and socioeconomic status.

Indoor Air Quality in City Buildings
The proposed standard for indoor air quality in city buildings outlined in bill #1130 will have widespread benefits, for over 300,000 city employees in addition to visiting building occupants and employers. Poor indoor air quality has been shown to impact cognitive function, work performance, and absenteeism. Avoiding these losses has been shown to save employers money while improving worker satisfaction.

Indoor Air Quality Data in Residential and Commercial Buildings
By collecting sufficient data on indoor air pollutants and setting standards in some spaces, the pilot programs proposed in bills #1128 and #1129 will help identify and address health and safety risks. New York City's building stock is varied in age, proximity to outdoor pollutant sources, fuel use, and energy performance, among other factors that may influence indoor air quality. These pilot programs will help clarify which of these factors influence indoor air quality.

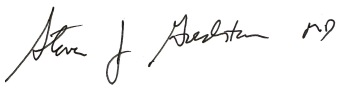
Additionally, these pilot programs will provide desired data access to New Yorkers. In the wake of COVID, people are more concerned about indoor air; a recent US survey showed 91% of consumers believe indoor air quality is critical to fight infectious disease, and 72% would benefit from available data on indoor air quality prior to entering a building.

Including the monitoring and standardization of nitrogen oxides (NO_x) will strengthen the proposed bills by maximizing air pollution reduction and human health benefits. In addition to the proposed pollutant list in all the bills, NO_x, a group of toxic gases including nitrogen dioxide (NO_2) and nitric oxide (NO), should be included due to the association of NO_2 exposure with a range of adverse health impacts, and the role of NO_x in the formation of other health harming pollutants such as ozone (O_3) and fine particulate matter ($PM_{2.5}$). NO_2 is a key criteria pollutant of concern, as exposure at even low levels is associated with respiratory effects, with greater impacts for sensitive groups like children including

increased risk of illness, asthma exacerbation and morbidity, lung and pulmonary function, and susceptibility to severe outcomes from diseases like COVID-19.[1]

Indoor air quality standards are an important step towards cleaner, healthier air and communities. We are encouraged by the proposal to regulate indoor air quality in New York City to protect human health, and are grateful for the opportunity to provide feedback.

Thank you,



Steven J Goldstein MD FAAP
Coordinator for Env. Health and Climate Change for NYS District II of the American Academy of Pediatrics
Chair, NYS AAP Chapter 2 Committee on Environmental Health and Climate Change
Past President, NY Chapter 2 of the American Academy of Pediatrics
NYS AAP Chapter 2 Climate Change Advocate
Past Climate Health Organizing Fellow, Cambridge Health
Founding Member, NY Clinicians for Climate Action
SJG34@Cornell.edu
NewYorkCCA@Gmail.com
Twitter: @SteveGoldstei10 @ClimateHealthNY
Cell: (516) 972-8319
#ClimateChangesNYHealth

Charles E. Moon III, MD
Chair, NYS AAP Chapter 3 Committee on Environmental Health & Climate Change
Executive Committee Member, New York Clinicians for Climate Action
Chief Resident, Social Pediatrics Residency Program, The Children's Hospital at Montefiore
CMoon@Montefiore.org

---

[1] United States Environmental Protection Agency (EPA), "Integrated Science Assessment (ISA) for Oxides of Nitrogen - Health Criteria," U.S. EPA, January 2016, https://www.epa.gov/isa/integrated-science-assessment-isa-oxides-nitrogen-health-criteria.; Kathleen Belanger et al., "Household Levels of Nitrogen Dioxide and Pediatric Asthma Severity," *Epidemiology* 24, no. 2 (March 2013): 320–30, https://doi.org/10.1097/ede.0b013e318280e2ac; *Clean the Air for Children: The Impact of Air Pollution on Children,* United Nations Children's Fund (UNICEF), Octover 2016, https://www.unicef.org/media/49966/file/UNICEF_Clear_the_Air_for_Children_30_Oct_2016.pdf; Kathleen Belanger et al., "Household Levels of Nitrogen Dioxide and Pediatric Asthma Severity," Epidemiology 24, no. 2 (March 2013): 320–30, https://doi.org/10.1097/ede.0b013e318280e2ac; Kathleen Belanger et al., "Association of Indoor Nitrogen Dioxide Exposure with Respiratory Symptoms in Children with Asthma," American Journal of Respiratory and Critical Care Medicine 173, no. 3 (February 2006): 297–303, https://doi.org/10.1164/rccm.200408-1123oc; Donghai Liang et al., "Urban Air Pollution May Enhance COVID-19 Case-Fatality and Mortality Rates in the United States," The Innovation, September 2020, https://www.cell.com/the-innovation/fulltext/S2666-6758(20)30050-3#%20

United Federation of Teachers Testimony Before the New York City Council Health Committee's Oversight Hearing on Protecting New Yorkers from Heat and Air Quality Emergencies

September 27, 2023

My name is Jeffrey Povalitis, Director of Safety and Health of the United Federation of Teachers (UFT). On behalf of the union's more than 190,000 members, I would like to thank Health Committee Chair Lynn C. Schulman for holding today's public hearing on protecting New Yorkers from heat and air quality emergencies.

Even before the COVID crisis, our Health and Safety team at the UFT made ensuring safe air quality in schools a high priority for decades. During and after the pandemic, this focus has become even more urgent. Before school buildings re-opened in September 2020, we worked to ensure that ventilation systems in every classroom throughout the city had been inspected, updated and repaired as needed. Each classroom was required to have adequate ventilation through either natural or mechanical means or a combination of the two. In addition to the upgraded ventilation systems introduced to buildings during this process, each classroom was equipped with two air purifiers. Cafeterias in bigger schools have large air units for added protection and window-based exhaust fans to provide additional air circulation. These measures meet or exceed guidance from the U.S. Centers for Disease Control and Prevention (CDC).

In regard to the bill being considered today, which would require the Department of Health and Mental Hygiene to set standards regarding air quality in schools, and would require the Department of Education, in collaboration with the Department of Environmental Protection, to issue real-time reports on the DOE website regarding air quality in schools, we support the Council's efforts to identify appropriate standards. In particular, we have long been fighting for an upper temperature limit to be set for our schools, and ambient temperatures and ambient humidity levels are measures that can be accurately gauged with reliable and affordable technology. In addition, the air conditioning products designed to resolve any issues found with temperature and humidity in classrooms and schools are currently available to install. We therefore strongly support both the development of standards around these measures and the continued efforts to ensure that all of our schools and classrooms have access to functioning and effective air conditioning systems.

Our team is eager to work with the Council, the DOE, the Department of Health, and other stakeholders in developing these and other air quality standards for schools. Ensuring that there is a thoughtful and well-informed process for both creating standards and assessing possible technologies for measuring them is crucial, since we have found that the processes for both measuring and mitigating carbon dioxide, carbon monoxide and particulates are more complicated than those for temperature and humidity. Currently, there are no federal Occupational Safety and Health Administration (OSHA) standards for indoor air quality, although there are industry guidelines (ASHRAE) and guidelines from the CDC that are often referenced. This absence of universal standards, combined with a dearth of effective technology, means that it will be challenging to provide accurate readings for several measurements called for in the bill, including a daily average of carbon dioxide, carbon monoxide levels and particulate pollution. We are concerned about the possibility of spending enormous amounts of city funds on measurement devices and monitoring systems when it is unlikely that any one meter or even a combination of meters can currently provide these readings effectively and accurately. Instead, we think it would be better to develop and implement performance-based standards that focus our resources on preventing and mitigating any damage to or lack of functional ventilation systems, rather than on measurement and reporting technology.

This is not to say that measurement devices should not be used in specific circumstances. For example, we have long supported the use of handheld carbon dioxide meters by school custodians and others when gauging air quality in classrooms, since carbon dioxide levels can be one useful proxy for determining when a room's ventilation might not be supplying adequate outside air. ASHRAE has recommended that a level of 700 parts per million and the outside reading for carbon dioxide be used to indicate a supply of 15 cubic feet per minute of outside air per person. Rooms without adequate ventilation will show carbon dioxide levels that are higher than 1,000 parts per million on these meters. During and after the pandemic, the UFT distributed hundreds of these carbon dioxide monitors to its district representatives and chapter advocates.

However, it is important to note that even readings from these meters have been found to be fraught with interpretation and user error, and there are cases of classrooms being closed based on faulty calibration and inaccurate measurements. In one case, custodians' readers mistook Purell hand sanitizer for formaldehyde during the pandemic, closing multiple classrooms. Meters that are designed to measure dust run into the challenge that thresholds for dusts and types of dusts can vary widely, so "dust" readings don't tell you enough to make an informed decision about what type of dust is being found or how to address it. Combining this lack of accurate technology and results with real time data release and no clear corrective measures would do more harm than good, leaving parents and staff full of fear and closing classrooms without good reason.

That said, it is urgent that we identify and fix issues with ventilation and air quality in all of our schools. Instead of spending money and time on questionable monitoring technology, we believe the Council and the DOE's efforts and funding would be better focused on developing clear performance standards for buildings, especially around ventilation systems, and on creating accurate means of measuring these performance standards and fixing problems when they are identified. In the area of ventilation measurement, strong industry standards do already exist for us to build on. For example, ASHRAE has issued the most comprehensive set of recommendations for indoor air quality; in the ASHRAE document 62.1, "Ventilation for Indoor Air Quality 2016," they recommend that all ventilation systems provide 15 cubic feet per minute of outside air per person in classrooms. The CDC has also released guidance for schools on this, which can serve as a helpful resource.

The question of consequences and mitigation is also crucial — again, stating something is a problem can do more harm than good without a clear plan in place to fix the issues. Unfortunately, we found during the pandemic that in some schools, the ventilation equipment had been run to failure and not fixed until COVID hit. In some cases, fixing the problem can be as easy as opening more windows and ensuring that vents are not blocked and the ventilation system is working. With the threatened budget cuts to the school system, there will be increased pressure to defer overall building maintenance, including the maintenance of fans, vents and other elements of ventilation systems that are crucial for maintaining air quality in schools. Resources should instead be put into increased preventative maintenance such as more frequent inspections (daily in some cases) and small but needed repairs, including visually inspecting and maintaining fan units and outside air dampers. If more resources are put into getting ventilation systems fixed as soon as they break, this will result in far more improvements to our schools' air quality than investing in expensive monitoring systems.

This is not to say that additional funding should not be provided to pay for new and effective technology. One particular point of concern is the ongoing removal and non-replacement of the MERV 13 filters that were installed during the pandemic. We believe it is urgent that these filters should be replaced rather than removed or swapped for less effective filters. MERV 13 filters and high-quality air dampers are high cost and high value because they work, especially in schools that rely on recirculated air (rather than the window air-conditioning units and rooftop units that bring in fresh air and are used in many buildings). Similarly, purchasing effective dust cleaners, upgrading older buildings' HVAC systems, and installing new air conditioners in preparation for future heat waves and potential smoke situations would all be better investments in the air quality in our schools than purchasing new meters.

In addition, one common problem with air quality in many of our schools that is unaddressed in this legislation involves water leaks and the growth of mold. None of the real-time monitoring devices cited in the proposed language will capture the air quality and health risks associated with damp, moldy buildings. And as with the other concerns raised around air quality above, prompt responses to water damage and timely repair of roof and masonry leaks are far better approaches to maintaining good indoor air quality than a focus on measurement and monitoring. Routine and prompt maintenance and repairs of our school buildings can prevent these conditions from becoming serious problems.

That said, if any data is going to be collected — for example, the temperature and humidity measures that we support — it should be clear how schools will directly benefit from it. We recommend the bill add more language on what corrective action is recommended or required when exceedance occurs. Ideally, data on these measures should feed into the school's Building Management System (BMS) and/or give an alert to the room staff and custodial engineer so that corrective actions can be taken on the school level as soon as possible.

As we move forward, we are committed to ensuring that the progress made during the pandemic to provide clean air and healthy learning environments in our schools is maintained. We look forward to continuing to work with the Council, the DOE and other stakeholders on this issue.

Testimony of WE ACT for Environmental Justice
to the New York City Council on September 27, 2023 regarding
Protecting New Yorkers from Heat and Air Quality Emergencies

Dear Committee on Health and Committee on Fire and Emergency Management:

WE ACT for Environmental Justice, an organization based in Harlem, has been fighting environmental racism at the city, state, and federal levels for more than 30 years. We recognize and fight to remedy the negative cumulative impacts of unjust policies that have plagued communities of color for decades.

Air Quality Emergencies

No legislation regulates indoor air quality in New York City, even though people spend 80-90% of their lives in indoor spaces. The number one reason for missed school days in the United States is asthma, and a study done between 2008-2013 showed that a combination of missed school days, ER visits, and medication for asthma led to $82 billion in costs. The proposed bills would establish long overdue programs regulating indoor air quality in city and school buildings, improving public health and decreasing healthcare costs.

Combustion appliances, environmental tobacco smoke, ambient air pollution, mold, and pests all influence indoor air quality. Short-term exposure to poor indoor air quality can cause headaches, dizziness, or fatigue. Long-term exposure can cause respiratory diseases, heart disease, or cancer. These harms are not distributed equitably across race, income, and gender. Even before the COVID-19 pandemic, Black Americans were three times more likely to die of asthma than white Americans. Across New York City, Harlem, Washington Heights, and the Bronx have significantly higher levels of asthma than other neighborhoods.

WE ACT supports the passage of the following bills with equity in mind to improve public health across New York City, particularly focused on environmental justice communities. There must be clearly defined, health-based standards that highlight specific pollutants and pollutant levels. Furthermore, there should be compliance processes that building owners and managers must follow to ensure that a healthy standard of living is being consistently met.

Int 1130-2023 (Standards and Reporting Regarding Indoor Air Quality in City Buildings):

This local law would require the NYC Department of Health and Mental Hygiene (DOHMH) to set standards for air quality in city buildings and monitor indoor air quality. DOHMH and the Department of Environmental Protection (DEP) would be required to post this information in conspicuous places in-person and virtually, as well as to publish an annual report on the city's indoor air quality. Lastly, DOHMH is required to do outreach and education around indoor air quality.

Int 1127-2023 (Standards and Reporting Regarding Indoor Air Quality in Schools within the City School District):

This local law would require DOHMH to set standards for air quality in schools in the city's district. The Department of Education (DOE) and DEP would be required to issue real-time and annual reports on indoor air quality in these schools. DOE and DOHMH would also be required to work to engage in outreach and education about indoor air quality in schools.

WE ACT suggests that Int 1130-2023 and Int 1127-2023 bill be amended to:

- Require reporting to include explanation of any excluded buildings
- Require renovations to improve indoor air quality if necessary after gathering indoor air quality data
- Add volatile organic compounds (VOCs) and nitrogen oxides, including nitrogen dioxide (NO_2), as pollutants to measure

First, requiring all reporting to include an explanation of any excluded city or school buildings will provide additional transparency and ensure all eligible buildings participate in monitoring. Second, requiring renovations to improve indoor air quality if necessary after gathering indoor air quality data. This data is only useful if changes are required to be made to improve indoor air quality. Lastly, there are well-documented health impacts of VOCs and (NO_2), and including these pollutants will ensure proper assessment of potential exposure.

WE ACT for Environmental Justice strongly urges the New York City Council to enact Int 1130-2023 and Int 1127-2023 with these suggested changes.

For the bills establishing pilot programs for commercial and residential buildings (Int 1128-2023 and Int 1127-2023, respectively) WE ACT is concerned that the data collected through the proposed pilot programs would offer limited potential for improving indoor air quality. WE ACT has a vested interest in monitoring indoor air, specifically in residential buildings, as

demonstrated by the Out of Gas pilot project we led last year to measure the indoor air quality impacts of gas stoves. Currently, 1129 would only require monitoring in common spaces, and would not measure pollutants where New Yorkers are exposed the most - inside their homes.

WE ACT suggests that Int 1129-2023 be amended to:

- Add monitoring for nitrogen oxides, including nitrogen dioxide (NO_2), specifically in buildings with combustion-based boilers.

While the work of our Out of Gas pilot project helped document the indoor air quality impacts of gas stoves, there is still necessary data to be collected regarding the impact on indoor air quality from combustion-based boilers that rely on natural gas and other combustion products to heat the air and water of buildings in New York City.

WE ACT for Environmental Justice urges the New York City Council to enact Int 1129-2023 with these suggested changes.

Heat Emergencies

WE ACT is asking the City Council to swiftly address the deadly impacts of extreme heat.

In the wake of a devastatingly hot and destructive summer, it is clear that NYC residents suffer disastrous consequences of delayed climate action. Global temperatures reached record highs while New York City only issued two heat advisories all season. During these sweltering conditions, people couldn't seek refuge in parks for several days in June due to the ash from the Canadian wildfires smothering the city. The Air Quality Index reached a value of 342, the most dangerous color category for pollution hazards, posing a dire threat to human health.

As climate impacts continue to layer, so do the consequences. Continued vehicle traffic in these conditions contradicted emergency advisories exacerbated harm to pregnant people, elders, young children, and those with cardiac and respiratory conditions. New Yorkers were faced with the terrifying choice of deciding whether they would inhale millions of toxic particles or risk heat-related illness since most air conditioning is accessible via window units. Research shows those without A/C likely could find no respite at home from the heat as their apartments sustained dangerous temperatures for days on end. All the while, many residents may have been unaware of free N95 mask distributions due to a lack of funding and preparation for such emergencies.

Despite the grim circumstances, there are policy strategies that will empower residents and fortify our city in these hellish scenarios. We urge this Council to advance the following legislation and strategies that will aid in adaptation and mitigation against extreme heat and air quality disasters:

1. The Creation of an Urban Forest Master Plan
2. Codify and fund the Cooling Center Program
3. Invest in advanced heat forecasting and notification systems

Introduction 1065-2023 (Urban Forest Master Plan)

This bill would require interagency coordination across city, state, and non-governmental stakeholders to create an integrated Urban Forest Master Plan aimed at protecting and increasing the City's urban forest. The bill has provisions to reach an urban canopy coverage goal of 30%,establish metrics to expand and protect the urban forest, and to require the collection of LIDaR (Light Detection and Ranging) data to monitor effectiveness of the plan. This would be updated every 5 years.

We need sophisticated planning and management of vegetation in the face of climate change because of the vast public health benefits trees offer. Trees and plants lower surface and air temperatures by providing shade and through evapotranspiration. Trees in cities also prevent approximately 1,200 heat-related deaths and countless heat-related illnesses each year. They also clean our air and act as a carbon sink, fighting climate change and filtering out harmful pollutants by removing an estimated 711,000 metric tons of air pollution annually and absorbing more than 90 million metric tons of carbon.

Codify and fund the Cooling Center Program

On declared heat emergency days, the city will open spaces for the public to seek air conditioning that is accessible and free to all. Sites include public libraries, community centers, senior centers, and more. The cooling center program is important for advancing equity around communities who bear the burden of extremely hot days**, especially for households that do not have an air conditioner or cannot afford the utility costs associated with running an AC**. However, the program is in many ways ad hoc. It has no budget, little consistency, and some neighborhoods lack locations within a 5 minute walking distance. The program is also extremely under utilized due to little to no wayfinding, signage or advertisements.

A report by the Comptroller's office *"Overheated, Underserved: Expanding Cooling Center Access"* **found that neighborhoods home to predominately people of color have the fewest cooling centers per 100,000 people**, and hours of access were limited despite persistent heat advisories. In order to remedy these disparities, the Cooling Center Program must be funded to the extent that residents will be able to access centers in their neighborhoods during every heat advisory, visit centers beyond regular business hours, utilize services and amenities that support their ability to prevent and/or quickly recover from heat related illness, engage in relevant and enriching programming at Cooling Centers, and maintain productivity in their personal lives. Additionally, once Cooling Centers are more frequently attended, sites should be supplied with air purifiers to offer respite from toxic air pollution and staff who are trained to share preparedness knowledge and resources when wildfires and heat waves coincide.

Invest in advanced heat forecasting and notification systems

The current system for Heat Advisory notifications perpetuates heat-health inequity. Our Heat Advisory protocol is based on the National Weather Service threshold of a heat index forecast reaching 95 to 99F for at least 2 consecutive days or 100 to 104F for any length of time. The air temperature monitoring device that tracks heat index is located in Central Park, which is below the citywide average temperature because of the high density of trees which cool the air. Not only is this threshold much higher than temperatures at which people start experiencing heat-related illness, vulnerable residents will have been exposed to even hotter temperatures by the time a Heat Advisory is issued. Heat-exacerbated deaths have been increasing in the past decade, mainly due to hotter summers overall with more "non-extreme hot days" of 82°F or up to but below the extreme heat threshold.

In order to truly proactively notify the most vulnerable residents, we need air temperature monitoring in their communities. For example, surface temperatures in East Harlem can register 30 degrees hotter than more affluent, tree lined neighborhoods like the Upper West Side. This stark disparity in heat exposure is not unique to East Harlem. Formerly redlined neighborhoods across the country tend to be 5 to 12 degrees hotter in summer. Redlined neighborhoods, which remain lower-income and more likely to have Black or Hispanic residents, consistently have far fewer trees and parks that help cool the air. They also have more paved surfaces, such as asphalt lots or nearby highways, that absorb and radiate heat. Likewise, while New York City does

offer an Advanced Warning System, it is targeted to organizations serving people with disabilities to opt into. It is not the standard and lacks language accessibility that is reflective of our diverse population.

Overall, marginalized communities must be brought to the center of New York City's emergency protocols. The events of this summer will become increasingly commonplace, and it is up to this Council to ensure no one else is sacrificed. Heat-related deaths are preventable. Health disparities related to air quality can be addressed through policy. Please enact these measures to save lives and uplift health equity for generations to come.

Sincerely,

Jaron Burke
Environmental Health Manager
646-906-3082| jaron@weact.org

Caleb Smith
Resiliency Coordinator
646-983-7288 | caleb.smith@weact.org

Shaping Tomorrow's Built Environment Today

September 27, 2023

The Honorable Lynn C. Schulman
Chairperson
Committee on Health
New York City Council
City Hall Park
New York, NY 10007

Letter sent via email to: District29@council.nyc.gov

Re: Int. 1127, 1128, 1129, 1130 – Indoor Air Quality

Dear Chair Schulman and Members of the Committee on Health:

ASHRAE, founded in 1894, is a global technical society advancing human well-being through sustainable technology for the built environment. The Society and its more than 53,000 members, including over 2,300 in New York State, focuses on building systems, energy efficiency, indoor air quality, refrigeration and sustainability. Through research, standards writing, publishing, certification and continuing education, ASHRAE shapes tomorrow's built environment today.

We are writing to you regarding the recently proposed legislation establishing standards and reporting requirements for indoor air quality (IAQ) in city buildings and school buildings, as well as pilot programs to monitor indoor air quality in certain commercial and residential buildings. ASHRAE suggests that these ambitious bills would be further strengthened by referencing ASHRAE Standards 62.1 and 62.2, *Ventilation and Acceptable Indoor Air Quality* for commercial and residential buildings, and ASHRAE's new Standard 241, *Control of Infectious Aerosols*.

We recommend that bills 1127, regarding school buildings, and 1130, regarding city buildings, incorporate ANSI/ASHRAE Standard 62.1-2022, *Ventilation and Acceptable Indoor Air Quality*, in their requirements for indoor air quality standards. IAQ can significantly affect student learning and development, and the COVID-19 pandemic has increased awareness of the impacts of IAQ on student health.[1] Adhering to the appropriate standards and guidance is essential to managing indoor air quality. Standard 62.1 specifies minimum ventilation rates and other measures intended to provide indoor air quality that is acceptable to human occupants and minimizes adverse health effects, due to poor indoor air quality. It defines the requirements for ventilation and air-cleaning system design, installation, commissioning, and operations and maintenance. It is intended for use in new buildings, as well as additions or changes to existing buildings. In addition, we also recommend the bills specify the most recent, up-to-date edition of Standard 62.1, which is currently the 2022 edition. This latest edition includes updates to the procedures and methods for meeting minimum ventilation and indoor air quality

[1] *Managing Air Quality During the Pandemic: How K-12 Schools Addressed Air Quality in the Second Year of COVID-19,* ASHRAE and USGBC Center for Green Schools, May 2022: https://www.ashrae.org/file%20library/technical%20resources/covid-19/managing_air_quality_during_the_pandemic.pdf

requirements, and a continued focus on indoor air quality, including improvements to the Indoor Air Quality Procedure (IAQP.)

ASHRAE also suggests the use of Standard 62.1 in bill 1128, establishing a pilot program to monitor IAQ in certain commercial buildings. Standard 62.2, the residential version of the standard, is likewise recommended for inclusion in bill 1129 regarding residential buildings. The voluntary pilot programs proposed by these bills would require measurement of ambient temperature, humidity levels, and certain air contaminants, and would benefit from incorporating the specifications and procedures in our 62.1 and 62.2 ventilation standards. The bills would also require the relevant agencies to make recommendations for improving IAQ in commercial and residential buildings, as well as recommendations for a permanent air quality regulatory framework, and these ASHRAE standards can assist in providing a valuable process for collecting and analyzing the necessary data to serve as a foundation for such a framework.

ASHRAE has also recently developed the new Standard 241, *Control of Infectious Aerosols*, a standard for buildings that is focused on airborne infection risk mitigation. It establishes minimum requirements for building owners, operators and professionals to improve IAQ by reducing the risk of airborne disease transmission by infectious aerosols. Standard 241 is meant to be applied in periods of elevated risk, for example the risk of transmission of pathogens like the SARS-COV-2 virus, which causes COVID-19. Under these conditions, buildings would operate in "Infection Risk Management Mode," and building operators would have the flexibility to choose between different equivalent clean air options based on what they determine is appropriate for that type of space, along with their specific energy use goals or cost restrictions. This flexibility makes Standard 241 a powerful tool for mitigating transmission risk that can be adapted for use in the different types of buildings covered by the proposed bills, in combination with Standards 62.1/62.2.

ASHRAE members and staff are happy to provide a briefing on Standard 241 upon request, including Dr. William Bahnfleth, Chair of the committee that developed the standard. If you would like to set up a briefing, or have any other questions, please do not hesitate to have your staff email GovAffairs@ashrae.org.

In summary, we strongly support the legislation's aim to improve indoor air quality in schools, commercial, residential and city buildings, and believe that can be done most effectively by referencing ASHRAE Standards 62.1, 62.2, and 241 in the relevant proposed bills. Thank you for your focus on indoor air quality and for working to ensure the health and well-being of building occupants.

Sincerely,

Ginger Scoggins
ASHRAE President 2023-2024

Asthma and Allergy Foundation of America

September 25, 2023

Lynn C. Schulman, Chair
Committee on Health
The New York City Council
City Hall New York, NY 10007

Dear Chairwoman Schulman:

On behalf of the Asthma and Allergy Foundation of America (AAFA), the leading patient organization advocating for people with asthma and allergies, and the oldest asthma and allergy patient organization in the world, I am writing to express our strong support for a number of bills that I understand your Committee will be considering on Wednesday, September 27, 2023. These important bills aim to improve and standardize indoor air quality in schools and city buildings and establish pilot programs to monitor indoor air quality in residential and commercial buildings. These bills include:

- Int 1127-2023: A Local Law to amend the administrative code of the city of New York, in relation to standards and reporting regarding indoor air quality in schools within the city school district
- Int 1128-2023: A Local Law in relation to establishing a pilot program to monitor indoor air quality in certain commercial buildings
- Int 1129-2023: A Local Law in relation to establishing a pilot program to monitor indoor air quality in certain residential buildings
- Int 1130-2023: A Local Law to amend the administrative code of the city of New York, in relation to standards and reporting regarding indoor air quality in city buildings

AAFA is dedicated to ensuring that all individuals have an optimal environment in which to live, learn, work and play. Indoor air pollution poses significant health risks: people spend an average of 90% of their time indoors and, according to the EPA, indoor air is more polluted than

outside air.[1] Of particular concern to AAFA is the strong body of evidence demonstrating that poor indoor air quality (IAQ) increases risks of severe asthma attacks and allergic reactions.[2]

The residents of New York City are in particular need of interventions to improve IAQ. In our recently released Asthma Capitals™ report,[3] New York City ranked 15th among the most challenging cities to live in when you have asthma and had the 5th highest asthma-related death rate overall. As detailed in our report, existing challenges for people with asthma in New York State were compounded last year by smoke originating from wildfires in Canada, contributing to an increase in asthma-associated ED visits.[4]

The Importance of Indoor Air Quality in Schools

While we applaud your efforts to advance all of these bills, Bill #1127 merits particular mention. This bill would require the Department of Health and Mental Hygiene to set standards regarding air quality in schools, and would require the Department of Education, in collaboration with the Department of Environmental Protection, to issue real time reports on the DOE website regarding air quality in schools and the installation and maintenance of air quality monitoring devices, as well as annual reports regarding air quality in schools.

Since children spend much of their time in the school environment, school indoor air quality can significantly influence their respiratory health. According to the EPA, approximately 53 million children and 6 million

---

[1] U.S. Environmental Protection Agency, "Why Indoor Air Quality is Important in Schools" Updated 2022). Available at https://www.epa.gov/iaq-schools/why-indoor-air-quality-important-schools

[2] Tiotiu AI, Novakova P, Nedeva D, Chong-Neto HJ, Novakova S, Steiropoulos P, Kowal K. Impact of Air Pollution on Asthma Outcomes. Int J Environ Res Public Health. 2020 Aug 27;17(17):6212. doi: 10.3390/ijerph17176212. PMID: 32867076; PMCID: PMC7503605.

[3] Asthma and Allergy Foundation of America, (2023). *2023 Asthma Capitals*. Available at www.asthmacapitals.com

[4] *Id.*

adults in the United States spend a large portion of their days in schools.[5] Research links key environmental factors to health outcomes and students' ability to perform. Improvements in school environmental quality can enhance academic performance, as well as teacher and staff productivity and retention.

Poor indoor air quality is a particular health concern for those with asthma and allergies because indoor triggers increase the risks of severe asthma attacks and allergic reactions.[6] Nearly 1 in 13 school-aged children have asthma, which is the leading cause of school absenteeism due to chronic illness. There is substantial evidence that indoor environmental exposure to allergens (such as dust mites, pests, and molds) plays a significant role in triggering asthma symptoms, and these allergens are common in schools.[7] Other factors that contribute to poor indoor air quality in schools include:

- **Poor Ventilation & HVAC Systems** - Inadequate ventilation results in high levels of harmful airborne particulates and carbon dioxide levels. It also leads to mold and bacteria growth.
- **Aging Buildings** – Many school buildings have not been updated for decades. As a result, many schools have problems with leaks, water damage and excessive moisture – which lead to dust, mold and other airborne allergens that contribute to poor indoor air quality.
- **Schools Located Near Sources of Pollution** – Schools that are located in busy cities or near highways face significant fumes from exhaust and gases like carbon monoxide. Like other factors affecting school indoor air quality, school location plays a role in exacerbating

---

[5] Environmental Protection Agency. Indoor Air: Improve Indoor Air Quality in Schools. http://www.epa.gov/airquality/community/details/i-schools_addl_info.html

[6] Environmental Protection Agency. Questions about your Community: Indoor Air. http://www.epa.gov/region1/communities/indoorair.html

[7] Esty B, Permaul P, DeLoreto K, Baxi SN, Phipatanakul W. Asthma and Allergies in the School Environment. Clin Rev Allergy Immunol. 2019 Dec;57(3):415-426. doi: 10.1007/s12016-019-08735-y. PMID: 31044354; PMCID: PMC6824974.

racial and ethnic disparities in asthma for children. For example, 15% of schools serving mostly children of color are near major roads, compared to only 4% of schools serving predominantly white students.[8]

AAFA has championed indoor air quality for decades, and we strongly support these bills to improve indoor air quality in New York City. Please do not hesitate to reach out to our Senior Director of Advocacy, Jenna Riemenschneider, at jennar@aafa.org with any questions.

Sincerely,

Kenneth Mendez
President and Chief Executive Officer
Asthma and Allergy Foundation of America

[8] Hopkins, J.S. (2017, February 17). The invisible hazard afflicting thousands of schools. Center for Public Integrity. https://publicintegrity.org/environment/the-invisible-hazard-afflicting-thousands-of-schools/

attune
8603 Westwood Center Drive
Suite 340
Vienna, VA 22182
571.766.6443
www.attuneiot.com

Testimony of Dr. Serene Almomen, CEO of Attune before the New York City Council Committee on Health

Good Morning and thank you to Chairperson Schulman and members of the New York City Council Health Committee for the opportunity to testify today.

I'm Dr. Serene Almomen, the CEO of Attune, and I'm here today to express our support for the inclusion of indoor air quality (IAQ) monitoring for schools, (Int. 1127) legislative proposal by Council Member Powers. We thank Council Member Powers and the co-sponsors of the legislation as well as members of this committee for their consideration and diligence in working on this proposal.

As the CEO of a company that makes indoor air quality monitoring systems for all manner of buildings, there is more to this support than our business model.

This legislative proposal would establish standards for indoor air quality monitoring in schools, require deployment of systems to measure air quality, create reporting on indoor air quality levels, enable ongoing testing and allow for public disclosure of IAQ levels within schools.

There is a clear need to monitor indoor air quality from the perspectives of student and educator health; academic performance and facility efficiency. We learned this first from the COVID-19 pandemic and most recently with the poor air quality resulting from the Canadian wildfires.

A June 2020 GAO Report found that nationwide 41 percent of school districts need to update or replace HVAC systems in at least half their schools.

attune
8603 Westwood Center Drive
Suite 340
Vienna, VA 22182
571.766.6443
www.attuneiot.com

According to the EPA, good indoor air quality (IAQ) contributes to a favorable environment for students, performance of teachers and staff, and a sense of comfort, health and well-being. EPA's definition of good indoor air quality (IAQ) includes:

- Control of airborne pollutants;
- Introduction and distribution of adequate outdoor air; and
- Maintenance of acceptable temperature and relative humidity.

Academically, there are numerous studies demonstrating an increase in student achievement related to improved indoor air quality. This includes one demonstrating an academic improvement of 15% associated with increased ventilation rates or lower CO2 concentrations.

While these studies are prominent, I'd like to address some of the key issues when measuring indoor air quality based on our extensive experience in this field.

Attune is a national leader in indoor air quality monitoring in schools. We have deployed 15,000 sensors in over 1,000 schools nationwide. This includes the Montgomery County Schools, the largest school district in Maryland. We are also in the Denver, Colorado school district, and presently, Attune is working in Atlanta, Georgia school district and schools in Las Vegas, Nevada among others.

In addition to working in large urban districts, we have also worked with state and local legislative bodies to pass smart and effective indoor air quality monitoring legislation. This includes in Illinois and California.

Here is what we have learned to date.

First- we need to make sure we are measuring the right particulate matter and the right size. We recommended the inclusion of measuring particulate pollution size of 1.0 micron and below.

attune
8603 Westwood Center Drive
Suite 340
Vienna, VA 22182
571.766.6443
www.attuneiot.com

This is the among the most difficult particulate size to filter out. It is also the particle size responsible for carrying COVID and other viruses. Having a sensor measure particulate of this size will help improve student and educator safety. The current legislation does not include this size.

The second recommended change is the inclusion of a minimum standard for effectiveness of sensors used in schools. Establishing a minimal performance standard should be easily achieved by reliable and proven sensors.

Presently, there are numerous products in the marketplace that rely on merely sensor datasheets (not representative of real-life conditions) or standards like RESET (not tested in lab environments).

We recommend the inclusion of language that would require sensors or sensor systems to have independent certification of effectiveness, by an accredited laboratory, in order to be put into schools.

What this standard means is that the sensors are validated to work by an independent 3rd party laboratory that has met rigorous standards for the quality of their evaluations. This change would impose a standard of proven effectiveness. This standard would not preclude effective products.

We believe, based on our extensive experience in this marketplace that these two simple changes will make this innovative proposal even stronger. These changes will ensure that students and educators are being protected by proven IAQ systems. This certification will also ensure taxpayer resources are spent on products proven to work.

Finally, we again compliment the Council Member Powers and the other sponsors of this legislation. We recently conducted a survey of 1500 people including parents and 95% of the

attune
8603 Westwood Center Drive
Suite 340
Vienna, VA 22182
571.766.6443
www.attuneiot.com

survey respondents in the Northeast said it was important to know the indoor air quality in their children's schools. So, we compliment the sponsors for their vision and awareness of this important issue.

Thank you for the opportunity to testify on behalf of Attune. I am happy to answer any questions.

Written Testimony of

Paula Olsiewski, PhD

Contributing Scholar, John Hopkins Center for Health Security

Bloomberg School of Public Health

For the

New York City Council

Committee on Health's Legislative Hearing: "Oversight – Protecting New Yorkers from Heat and Air Quality Emergencies"

September 27, 2023, 1:00PM

Submitted online on September 29, 2023

Committee Room – City Hall

Summary

LS 7316, LS 7367, LS 9582, and LS 13447 represent important steps to enhance the indoor air quality ["IAQ"] in New York City's commercial and residential properties, and its schools. The data collection, monitoring, and publication of a building's indoor air quality (IAQ) are particularly important, as they give New Yorkers the knowledge and ability to protect their health, while giving policymakers and researchers the ability to craft responses guided by science. However, the bills could be strengthened by the creation of a central IAQ agency or body, creation of comprehensive IAQ plans, and by enhanced enforcement powers, which would give responsible agencies the ability to respond to and remedy unacceptable IAQ uncovered in buildings.

Introduction

Chairperson Shulman and distinguished members of this Committee, I'm honored to testify today to express my strong support for the proposed New York City bills LS 7316, LS 7367, LS 9582, and LS 13447. Collectively, these bills aim to significantly enhance IAQ across our city's buildings, playing a crucial role in the mitigation of wildfire smoke events, airborne disease, bioterrorist attacks, and other harmful pollutants, while improving the health of New Yorkers.

I am a Contributing Scholar at the Johns Hopkins Center for Health Security, where I direct the Center's work on IAQ policy to mitigate airborne disease and biological risks. I have a PhD in Chemistry from the Massachusetts Institute of Technology and have been working on the indoor environment for over two decades, I also have been an advisor to the US Environmental Protection Agency. Today I am testifying in my personal capacity and as a longtime resident of New York City. The opinions expressed herein are my own and do not necessarily reflect the views of Johns Hopkins University.

Indoor air quality is important because people spend 90% of their time indoors – that's where we breathe almost a swimming pool full of air every day. Given the volume of indoor air we breathe, it's important to know whether that air is clean or whether it contains anything toxic.

Tiny harmful invisible pollutants called PM 2.5 float in the air. Elevated levels of these airborne pollutants are associated with pregnancy loss, cancer, dementia, cardiovascular disease, asthma, COPD, and other health problems.

And yes, airborne diseases, such as flu, RSV, Covid, measles, and other diseases all float in the air on tiny bits of breath traveling long distances indoors.

Unlike outdoor air, regulated by the Clean Air Act or drinking water, regulated by the Safe Drinking Water Act, indoor air quality is not regulated.

Today, when you enter a building, you have no idea if the air quality is acceptable. As an indoor air quality expert, I carry around a carbon dioxide meter to assess ventilation. If there is good ventilation, the levels will stay below 1000 ppm.

Last year, I served for month on a grand jury at 100 Center Street for one month. Fortunately, the security guards allowed me to bring in my carbon dioxide meter. Much to my surprise, the readings

were good, indicating that the jury room, filled with grand jurors, assistant district attorneys, court reporters, witnesses, and others, had good ventilation- which means the air in the room was diluted with fresh air on a regular basis.

The CO2 readings were also good at the DMV when I renewed my license – and I shared this good news with the clerk, but no one else knew! If only there was a display of IAQ measures next to the sign for who is next!

Fortunately, there are steps that property owners can take in order to improve the IAQ in their buildings. These include increased ventilation and filtration, which have the potential to prevent harm to our health without relying on the behaviors and actions of individuals. However, property owners often lack incentives to install such technologies. Thus, IAQ in different buildings currently depends largely on the goodwill of the property owners. I have long advocated for regulatory requirements for IAQ improvements. At the Center for Health Security (CHS), we've crafted a Model Clean Indoor Air Act (Model Act) that describes what to do when that IAQ alarm goes off, and I'd be happy to lend expertise in this area. Many of the provisions that are in the proposed regulation align closely with what we have developed.

Strengths of Proposed NY Bills

Today's bills, if enacted, will make indoor air quality visible by testing the air and reporting the findings in public buildings, city schools, and in certain residential and commercial settings. They establish a measurable set of factors to assess IAQ and report these findings in NYC's schools, city buildings, commercial buildings, and residential buildings and will set safe indoor air quality standards for NYC schools and public buildings. There are two provisions of these bills that I want to highlight as particularly strong:

1. These bills contain robust data collection provisions by requiring responsible agencies to collect data on IAQ, prominently post building IAQ levels in public places, and conduct education and outreach efforts designed to improve IAQ. Collecting and communicating this data will both increase New Yorkers' awareness of the importance of IAQ and allow them to make more informed decisions about their health, by avoiding environments that could create or exacerbate health conditions. It also gives policymakers and researchers access to vital information that they can use to guide regulatory and scientific decision-making, ensuring that future IAQ laws are driven by facts. This data will be particularly useful given the comprehensive approach taken in these bills, focusing on both residential and commercial buildings, meaning that data will be collected from a wide variety of important settings.

   LS 9582's monitoring and data collection provisions are especially impressive, requiring the measurement of air changes per hour in our schools. This is an especially useful measurement from the perspective of pathogen mitigation. However, it is essential to emphasize that this measure should also be inclusive of equivalent air changes per hour, accounting for additional IAQ improvement methods like filtration and UV disinfection. This holistic assessment would not only give a more accurate representation of air quality but would also provide a broader framework for pathogen mitigation. Applying this comprehensive measure to LS 13447 would

be an excellent next step, ensuring all city buildings benefit from such comprehensive IAQ monitoring and mitigation strategies.

2. These bills involve key agencies, including New York's Department of Mental Health and Hygiene, and the Commissioner of Environmental protection. The policy-making benefits of data collection that I mentioned earlier will be all the more effective because the data is shared with agencies that are responsible for making crucial determinations and policies that relate to New Yorkers' health.

Limitations of proposed legislation

Monitoring IAQ and reporting on IAQ are important first steps for ensuring healthy indoor air quality. However, the bills as drafted have some limitations. What is missing from the existing bills is a plan for what to do when the IAQ alarm goes off – when IAQ is found to be unacceptably poor. If a fire alarm goes off, we all know who to call and what to do. The proposed bills leave open several key emergency response questions. Three changes would make the bills especially efficacious:

1. The bills do not contain provisions for what should be done when unhealthy indoor air quality is detected. Should the facilities managers of schools and city buildings be required to identify and resolve unacceptable air quality issues? Should there be performance-based standards for the operation and maintenance of the buildings? What are the ramifications if IAQ problems are not addressed? CHS' Model Act provides answers to these questions. It allows building occupants or any other aggrieved members of the public to file a complaint with the responsible agency when IAQ is poor in a particular location. Additionally, it gives responsible agencies the authority to independently investigate IAQ events that they have detected, and to carry out periodic inspections. If an IAQ violation is found, the responsible agencies have the authority to require property owners to take remedial steps. These provisions would give the public and the responsible agencies the ability to respond to an IAQ alarm quickly and effectively.

2. Additionally, while it is particularly useful to involve the agencies currently given responsibility for the bill, as I have noted above, it may be more efficient to have a lead city agency for IAQ. As the bills are currently written, it is unclear which City agency has expertise in the Department of Education is tasked with setting IAQ standards for schools. For City Buildings, it is unclear which department will be tasked with establishing IAQ standards. The Department of Environmental Protection is tasked with determining which tests should be used to measure indoor air quality. The Department of Health and Mental Hygiene is tasked with the two pilot programs for commercial buildings and residential buildings. A lead agency would make data collection and data-informed policymaking even more effective by ensuring that information is not siloed in different agencies, and that learnings are shared. It also creates a go-to repository of expertise that other agencies know to approach with any question.

   CHS' Model Act proposes the creation of an IAQ Advisory Council, which brings together representatives from all relevant agencies, as well as the legislative branch, key healthcare bodies, and the private sectors. This body is empowered to collect data from a variety of sources and helps craft IAQ recommendations and monitoring techniques and ensures harmonization

between the regulations of different agencies. It may be useful for New York to consider a similar body.

3. It would also be beneficial if the bills contained provisions for the development of comprehensive IAQ plans. CHS' Model Act proposes the creation of an IAQ plan to develop a comprehensive plan to help assess and set priorities for improving IAQ in buildings through the mitigation of contaminants, and identification of environmental, public health, and other bases for intervention.

Overall, these bills represent a holistic, evidence-based approach to improving IAQ and public health in our city. Passing this legislation demonstrates New York City's continued leadership in implementing policies that protect community wellbeing. I applaud the Committee's work and urge you to approve these important pieces of legislation.

Thank you for your dedication to improving the lives of New Yorkers. Thank you also for your time, and I stand ready to be a resource for this Committee on it's very important work.

Sincerely,

Paula J. Olsiewski, PhD
Contributing Scholar

Brooklyn Defenders

Brooklyn Defender Services
177 Livingston St, 7th Fl
Brooklyn, NY 11201

Tel (718) 254-0700
Fax (718) 254-0897

TESTIMONY OF:

Michael Klinger
Jail Services Attorney

BROOKLYN DEFENDER SERVICES

Presented before

The New York City Council Committee on Health

Oversight - Protecting New Yorkers from Heat and Air Quality Emergencies

September 27, 2023

My name is Michael Klinger. I am a Jail Services Attorney at Brooklyn Defender Services (BDS). We thank Chair Schulman, Speaker Adams, and the Committee on Health for the opportunity to testify on the topic of protecting New Yorkers from heat and air quality emergencies.

BDS is a public defense office whose mission is to provide outstanding representation and advocacy free of cost to people facing loss of freedom, family separation, and other serious legal harms by the government. For more than 25 years, BDS has worked, in and out of court, to protect and uphold the rights of individuals and to change laws and systems that perpetuate injustice and inequality. Thousands of the people we represent are detained or incarcerated in the New York City jail system each year while fighting their cases in court or serving a sentence of a year or less upon conviction of a misdemeanor. Our staff consists of specialized attorneys, social workers, investigators, paralegals, and administrative staff who are experts in their individual fields.

In addition to zealous legal defense, BDS provides a wide range of services to address the causes and consequences of legal system involvement. We have built a practice around supporting people who are detained pretrial to mitigate the burdens and trauma created by confinement and to protect our clients from collateral consequences. Through our jail-based programming, we are able to advocate for our clients to access services they are entitled to such as medical care and educational access. Additionally, our established presence in New York City jails allows us to monitor and document the conditions New Yorkers encounter when incarcerated and advocate for the basic human rights, health, and safety of our clients and other incarcerated people. Furthermore, many of the people that we serve live in heavily policed and highly surveilled communities.

This past summer, New Yorkers were forced not only to find ways to stay cool during record-breaking heat, but also to navigate multiple weeks of historically poor air quality. These conditions

acutely harm the people held in Department of Correction ("DOC" or "Department") facilities who depend on the Department and the city for nearly every aspect of their health, safety, and security. The city must ensure that in providing guidance and assistance related to heat and air quality emergencies, it is affirmatively considering and protecting the people in its custody.

Heat Emergencies

The city jails have long struggled to maintain safe temperatures, whether during the cold of winter or the heat of summer.[1] Every summer people in DOC custody report excessively hot housing units, lack of access to clean clothes, and an inability to access methods for cooling. Despite the fact that the Department issues on its website information regarding how it intends to protect the health and safety of incarcerated people during extreme heat, generally referred to as a "heat action plan,"[2] year after year those plans are not implemented consistently or effectively, exposing already-vulnerable people to extreme and dangerous conditions.[3]

The 2023 plan includes provisions to keep people cool by providing "[a]t least two industrial-sized fans … in non-air-conditioned housing units," delivering ice "regularly during the hottest hours of the day and every [two] hours to individuals in housing areas that do not have air conditioning," maintaining "[o]ne shower station per non air-conditioned housing area … as a cool shower station to encourage individuals to take cool showers," "monitor[ing] people in custody for signs of heat-related illness," and in cases where the ambient temperature exceeds 80 degrees in air-conditioned areas, temporarily relocating heat-sensitive individuals to areas below 80 degrees "if the AC cannot be repaired in a timely manner."[4]

---

[1] *See, e.g.*, Graham Rayman, *Two Rikers jails lose heat four days after NYC certified systems fully functioning; steam line rupture blamed*, Daily News (Oct. 27, 2022), available at https://www.nydailynews.com/2022/10/27/two-rikers-jails-lose-heat-four-days-after-nyc-certified-systems-fully-functioning-steam-line-rupture-blamed/; *see also* reports from 2014 and 2019: Alisa Roth, *Do Heat-Sensitive Inmates Have a Right to Air Conditioning?*, NPR (Jul. 24, 2014), available at https://www.nhpr.org/national/2014-07-24/hot-prisons-could-be-deadly-for-u-s-inmates-advocates-warn; Rosa Goldensohn and Reuven Blau, *Sweltering City Jail Cells Need Air Conditioning, Says Board of Correction*, The City (Jul. 23, 2019), available at https://www.thecity.nyc/justice/2019/7/23/21210932/sweltering-city-jail-cells-need-air-conditioning-says-board-of-correction; Chelsea Rose Marcius, *Some Rikers Island Inmates had no AC during heat wave, Legal Aid says*, Daily News (Jul. 23, 2019), available at https://www.nydailynews.com/2019/07/23/some-rikers-island-inmates-had-no-ac-during-heat-wave-legal-aid-says/.

[2] The Department posted its public plans to manage the summer heat in 2022 online under the unifying title, "Heat Action Plan," which remains available on its website. *See* Department of Correction, *Heat Action Plan* (hereinafter "2022 Heat Plan"), available at https://www.nyc.gov/site/doc/media/doc-heat-plan.page. Its nearly-identical 2023 plan appeared less prominently, no longer identified as "Heat Action Plan," on the Department website under "News Releases and Other Information," then by following a link to a "Warm Weather Protocol," finally landing on a page entitled "Heat Sensitivity & Housing." *See* Department of Correction, *Heat Sensitivity & Housing* (hereinafter "2023 Heat Sensitivity & Housing"), available at https://www.nyc.gov/site/doc/media/heat_sensitivity.page. While the 2023 plans imply some progress has been made since 2022, they show that the Department housed only 56% of people in custody in air-conditioned units in both years. *Id.*

[3] *See, e.g.*, Liz Donovan, *As Conditions at Rikers Reach Crisis Levels, Concerns About Heat Persist*, City Limits (Sept. 13, 2021), available at https://citylimits.org/2021/09/13/as-conditions-at-rikers-reach-crisis-levels-concerns-about-heat-persist/.

[4] *See* 2023 Heat Sensitivity & Housing, supra n. 2.

Nonetheless, this past summer, which featured record heat and dire warnings from local officials,[5] BDS heard repeatedly from clients about housing units where, in addition to no working air conditioning, there were fewer than two working fans (or, in some cases, none at all), no regular provision of ice, and in the case of at least one housing unit at the newly re-opened Otis Bantum Correctional Center, showers that delivered only scalding hot water, rather than the promised relief of cold-water showers.[6]

During the early-September heat wave New York City experienced, BDS learned that intake dorm 5 Main in the Eric M. Taylor Center had no working air conditioning and only one fan for the entire unit. At Mod 3 Lower South in the Robert N. Davoren Center ("RNDC"), which BDS understands is a dorm specifically designated for people with heat sensitivity, there was no working air conditioning and there were no working fans during that same September heat wave. A person we represent housed in a heat-sensitive dorm at RNDC waited approximately five hours after briefly losing consciousness before DOC brought him to the medical clinic, despite knowing he suffers from heat sensitivity, a heart condition, and a recent history of fainting.[7]

In short, far from meeting the assurances of its own heat action plans and despite the increasing predictability of New York's dangerously hot summer weather, the Department routinely fails to

---

[5] Delger Erdenesanaa, *Earth's Hottest August on Record Followed a Record-Breaking June and July*, The New York Times (Sept. 21, 2023), available at https://www.nytimes.com/2023/09/21/climate/hottest-august-on-record.html; *see also*, Estefania Hernandez, *New York City under Heat Advisory amid 'extreme heat'*, Spectrum News (Jul. 28, 2023), available at https://ny1.com/nyc/all-boroughs/weather/2023/07/28/new-york-city-under-heat-advisory-amid--extreme-heat- ("[New York City Emergency Management Commissioner Zach Iscol] encouraged New Yorkers to stay indoors with air conditioning," and said, "We have an [Air Quality Index] of 108, which is unhealthy for sensitive groups, so that's children, older adults, people with respiratory and heart conditions, due to ozone, not due to wildfires."); Christopher Bonanos, *On New York's First 110-Degree Summer Day, What Will Break First?*, Curbed New York (Jul. 28, 2023), available at https://www.curbed.com/2023/07/new-york-infrastructure-climate-hottest-days.html; David Lazar, Patrick Adcroft and Spectrum News Staff, *Excessive Heat Warning issued for New York City through Friday*, Spectrum News (Jul. 27, 2023), available at https://ny1.com/nyc/all-boroughs/weather/2023/07/26/new-york-city-heat-wave-thursday-friday-saturday-excessive-heat-warning-heat-advisory-national-weather-service-department-of-parks-and-recreation ("With extreme heat bearing down on the city, Mayor Eric Adams on Thursday urged New Yorkers to take the hot weather seriously, calling it a 'climate disaster' capable of deadly consequences."); Natalie O'Neill, *Dangerous heat wave will scorch NYC with hottest July in three years*, New York Post (Jul. 27, 2023), available at https://nypost.com/2023/07/27/dangerous-heatwave-will-scorch-nyc-with-hottest-july-on-record-in-years/ ("The National Weather Service issued an excessive heat warning for the city Thursday as temperatures were forecast to hit an oppressive high of 95 — and feel 'in excess of 102,' said Fox Weather meteorologist Brian Mastro.").

[6] *Supra* at n. 4 and accompanying text.

[7] The Department's consistent failures to connect people in its custody to medical services is pervasive in the jails and in reports from BDS clients, and not limited to circumstances featuring extreme heat. In *In re Agnew v. New York City Dept. of Correction*, brought by individuals represented by Brooklyn Defender Services, The Legal Aid Society, and Millbank LLP, The Supreme Court of the State of New York County of The Bronx found in December 2021 that the Department has failed to provide access to medical care for incarcerated New Yorkers in the City Jails. *Agnew*, No. 813431-2021E, 2021 WL 6104121 (N.Y. Sup. Ct. Dec. 03, 2021). The case is still active, with the Plaintiffs arguing that the Department is in contempt of Court orders requiring it to provide basic access to medical care for people in the City jails. *See, e.g.*, *Agnew v. New York City Dep't of Correction*, 217 A.D.3d 490, 191 N.Y.S.3d 45 (2023).

provide basic protections necessary to keep people cool, safe, and healthy, even after identifying particular people as heat sensitive.

Air Quality Emergencies

This past summer also saw frightening air quality conditions and advisories, due primarily to harmful and intense smoke from Canadian wildfires, with various agencies and officials urging people throughout the New York Metropolitan Area and beyond to take precautions ranging from remaining indoors to closing and sealing windows and wearing well-fitting N95 or KN95 masks.[8]

However, people we serve consistently reported that no such precautions were available in the jails. Instead, they reported that during the worst of the air pollution conditions they were unable to close windows to the outdoors, unable to mitigate the smell of smoke indoors, did not have access to masks upon request, and in many cases had difficulty accessing medical attention for breathing and asthma-related complaints.

Additionally, for people in the custody of DOC, the anomalous season of smoke-filled skies was not the only air quality concern in the jails this summer, and particularly not for people with medical vulnerabilities including asthma and various heart and lung conditions. That is because the Department routinely deploys so-called "Chemical Agents,"[9] which threaten everyone who comes into contact while not wearing protective clothing and equipment, and which pose particular and grave risks to medically vulnerable people. The Department's directives address these risks and the need to provide protections,[10] but the Department fails to implement these safeguards after deploying chemical agents in enclosed and densely populated housing units.

---

[8] *See, e.g.*, New York State Department of Environmental Conservation, June 7, 2023, Air Quality Health Advisory Issued for Long Island, New York City Metro, Lower Hudson Valley, Upper Hudson Valley, Eastern Lake Ontario, Central New York and Western New York [Press Release], available at https://www.dec.ny.gov/press/127840.html; New York City Public Advocate Jumaane D. Williams, Jun. 8, 2023, Stay Safe, NYC! June 2023 Air Quality Health Advisory [Press Release], available at https://www.pubadvocate.nyc.gov/blog/2023/06/08/stay-safe-nyc-air-quality-health-advisory/ ("Remain indoors as much as possible. Close the windows in your home and ensure they are sealed. Wear a high quality, well-fitting mask, such as an N95 or a KN95, when outdoors. One day use is recommended; after one day, discard the mask. … If you need to go outside, prioritize eye protection. Consider wearing protective eyewear, like goggles or wraparound glasses or sunglasses. If available, use air purifiers indoors for at least 48 hours (HEPA filters recommended). Humidifiers can also help capture air particles….").

[9] *See, e.g.*, Special Report by the *Nunez* Independent Monitor, July 10, 2023 at 25-26, 36-37, 39, 50, available at https://tillidgroup.com/wp-content/uploads/2023/07/2023-07-10-Monitors-Report.pdf (Describing multiple examples of problematic staff use of chemical agents, and citing "[p]oor staff practice was revealed in numerous events that involved staff … deploying chemical agents in excessive amounts and at unsafe distance….").

[10] *See* Department of Correction Directive 5006R-D (1/31/08), "Use of Force," which requires, among other things, that Department staff "confer[] with a medical care staff member prior to the use of force to gather pertinent information about the inmate's medical condition and mental health status to ensure that there are no issues that contraindicate the application of any specific type of force (e.g., clearance for the use of chemical agents….)." Directive 5006R-D at p. 9 of 27; *see also, id.* at 16 of 27 ("Whenever a chemical agent or other use of force, as defined by this Directive, is used against an Inmate, the Tour Commander or supervisor assigned by the Tour Commander shall, as soon as possible, ensure that the inmate and injured Staff are afforded examination by medical

BDS clients routinely report that once exposed to chemical agents, they either never receive decontamination and medical attention, or they must wait an extremely long time, sometimes as long as a period of days or even weeks. Furthermore, the people we represent report that sprayed surfaces are rarely, if ever, decontaminated, so the residual chemical agents continue to affect anyone who touches those surfaces—walls, beds and bedding, clothing, tables, and chairs, etc.—for days and weeks following the initial deployment of the chemical agent. One particularly vulnerable client reported that, although he has never been the intended target of the sprays, officers have sprayed him with chemical agents on multiple occasions when they responded to alleged disturbances in his housing unit. In every instance, he has been left struggling to breathe and coughing up blood. Twice this past summer, it took the Department more than one week to bring him to receive medical attention following such incidents of chemical exposure.

The Department is failing to follow its own directives with respect to mitigating the dangerous and lingering effects of chemical sprays. It is also failing to provide emergency medical care to those people whose existing vulnerabilities leave them gasping for breath after the Department sprays them.

Conclusion

We appreciate the Council's attention to the issues around heat and air quality emergencies in city buildings, and its consideration of the needs of the New Yorkers in the custody of the Department of Correction, whose safety and security is entirely and solely under the control of the city. If you have any questions, please feel free to contact me at mklinger@bds.org.

staff to determine the extent of injuries, if any, and provided proper medical attention if needed."); Department of Correction Directive 4510R-E (7/27/07), "Chemical Agents," generally requiring that people who have been exposed to such agents "shall shower or wash in cool water," and after completing such "decontamination," the area supervisor "shall ensure that prompt medical attention is given to the individual(s) affected by the dispensing of the chemical agents." Importantly, the Directive requires that, "[u]nder no circumstances shall the subject(s) remain in the contaminated area for a period exceeding five (5) minutes after the hand-held aerosol application." Directive 4510R-E at 13 of 19.

Good afternoon. My name is Alan Watts, and I am a director with CerroZone, a Berkshire Hathaway Company. CerroZone is an Indoor Air Quality company that engineers and manufacturers technology to create safer and healthier indoor environments.

However, I am not here to sell the council our products or technology. I am here to offer our support to these very important pieces of legislation. I am also here to share in this once- in-a-generation opportunity to change the trajectory of the health and safety of the infrastructure of New York City.

As a lifelong New Yorker, I have seen the effects of the New York City infrastructure deteriorate over time. As a senior executive and professional in the Pathogen Control Space, I understand the unique problems that our city's buildings face due to their age and lack of investment in upgrading ventilation systems.

The Covid-19 Pandemic has opened the public's eyes and awareness of several key facts. Here are three of them:

1. Humans are the source of airborne disease and contamination.
2. Being in close proximity at others at our places of work, school or anywhere indoors that people congregate, increases our risk of exposure to harmful airborne pathogens.
3. Our buildings lack the proper ventilation or technology to protect us from exposure to these airborne pathogens and VOCs.

We certainly cannot keep ourselves wrapped in a bubble to prevent human interaction. Although, there are times that we would love to do so!

Through this proposed legislation, we may finally have the unique opportunity to create a path forward to call New York City, “The Safest Indoor City in the World!

The question is “How do we get there”?

From my perspective, there are three non-negotiable pillars .

1. Science & Technology, 2. Validated Proof Data and 3. Government Oversight.

1. Science & Technology

There are two distinct and independent pieces to the science of indoor air quality management.

1. Sensor Technology – Making the invisible, visible. Understanding and reporting the air quality of our indoor spaces is fundamental. Companies such as WellStat, based here in NYC, are leading is providing critical real-time data and insight into our indoor air quality.

2. Pathogen & VOC Control – Deploying proven technology that will eradicate airborne pathogens and VOCs, independent of a buildings HVAC system, is the heartbeat of Indoor Air Quality management.

An important note – these two technologies should not be incorporated into the same device. We need sensor technology companies to keep pathogen control manufacturers honest.

2. Validated Proof Data

AHSRAE, The American Society of Heating, Refrigerating and Air-Conditioning Engineers, is the global body for HVAC design.

On July 21, 2023, ASHRAE adopted Standard 241 which defines the Control of Infectious Aerosols. This standard, which was initiated by the White House, is the first step in offering a minimum requirement aimed at reducing the risk of disease transmission of infectious aerosols in new buildings, existing buildings, and major renovations.

Any device that is purchased to provide pathogen control, must have achieved the following baseline standards:

1. Has achieved FDA 510(k) Class II medical device certification
2. Has achieved ASHRAE Standard 241 testing compliance as a manufacturer
3. Has achieved a UL "Zero Ozone" certification
4. Has 3rd Party Clinical Validation

No device should be allowed to be installed in any New York City building that has not achieved these rigorous standards.

3. Government Oversight

1. ASHRAE Standard 241 should be the minimum standard which all buildings are held to with regards to the Control of Infectious Aerosols.
2. Real-time data from sensor technology should be required to maintain a reporting standard of baseline Indoor Air Quality and also to provide a check on the efficacy of any pathogen control technology.
3. Buildings that do not comply with standards set by these laws and policies, should be subject to penalties and fines.

Protecting human life is of the highest importance to any government. Covid-19 was not the first pandemic and certainly will not be the last. Collectively, we have the opportunity to change the path of health and safety of the Indoor Air Quality of this city.

CerroZone is dedicated to being a part of this historic moment and effort to protect our city for the future. On a personal level, I offer my expertise, time, and effort to assist the City of New York in this ongoing opportunity.

Thank you very much.

CERROZONE™

Indoor Air Quality Management

Engineered For Real Estate

- ✓ FDA 510(k) Class II Medical Device Clearance
- ✓ UL 2998 "Zero Ozone" Designation
- ✓ California CARB Standard Compliant
- ✓ 3rd Party Clinical Validation
- ✓ Made in the USA
- ✓ A Marmon/Berkshire Hathaway Company

Built to Defend

ASHRAE®

ASHRAE Standard 241

Control of Infectious Aerosols

"CerroZone has become the first company to meet and exceed the requirements for Air Purifiers set out in the recently published ASHRAE Standard 241-2023 Control of Infectious Aerosols"

CerroZone, LLC
A Marmon / Berkshire Hathaway Company
www.CerroZone.com

CERROZONE™

Continuous *Room-Based* IAQ Management

We Operate at the Source of Contamination and Disease Transmission

People are the Source of Contamination

- Humans shed **37 million** bacteria per hour
- These pathogens travel through the air on indoor **air currents**
- Airborne pathogens land on surfaces creating additional pathways of **Disease Transmission**

CerroZone Works at the Source of the Problem

- CerroZone **operates 24/7** and eliminates opportunistic pathogens and VOCs **at the Source** where they are created and spread
- Maintaining Healthy Environments in **Commercial Real Estate is Critical** in today's market
- Reduction of Airborne Pathogens, VOCs & Odors **Keeps Facilities Safer** for Tenants, Staff, and Visitors

Don't Simply Take Our Word For It

Proof of Efficacy – 3rd Party Testing

Bacteriophage MS2 – over 99.998% per pass, 99.9999% removal in a room.

SARS-CoV-2 (original and Delta strains) – over 99.998% per pass, 99.9999% removal in a room.

Gram-Positive (Staphylococcus) and **Gram-Negative** (Pseudomonas) **bacteria** - over 99% removal per/pass with both.

Ammonia (NH_4) – 100% removal (hit limits of detection) per/pass.

Hydrogen Sulfide (H_2S) – 100% removal (hit limits of detection) per/pass.

Ozone (O_3) – "Zero Ozone" testing and certification at Intertek.

SAFETY VALIDATION

Organization/Third Party	Test	Results
FDA	510(k) Class II Medical Device Clearance	✓
Intertek	UL 867	✓
Intertek	CSA C22.2	✓
Intertek	UL 2998 ("Zero Ozone" designation)	✓
Intertek	IEC 60601-1-2	✓
Intertek	AIM 7351731	✓
Intertek	AHAM AC-2 Sound Testing	50 Decibels (dB), 4.64 Sones
CARB	Clearance to sell air cleaning device	✓

AEROSOL Research and Engineering Laboratories

MRIGlobal

INTERTEK SUSTAINABILITY VERIFIED ZERO OZONE DOES NOT EMIT MORE THAN 0.005PPM AS TESTED PER UL 867

INNOVATIVE BIOANALYSIS

FDA 510(k) US- FDA

Mizzou University of Missouri

CerroZone does *NOT* create any harmful byproducts or add any dangerous chemicals to the air.

CERRO ZONE™

Continuous *Room-Based* IAQ Management

Continuous Elimination of Viruses, Bacteria, Mold, Fungi & VOCs

VOCs are a Major Pollutant of indoor air and can negatively impact human health.

VOCs also cause **Bad Odors** that impact indoor air quality.

Long-term exposure to VOCs can cause **Serious Health Problems** and **Sick Building Syndrome**.

CerroZone Mobile
(220 CFM)
28.75" wide x 54" high

CerroZone Mini
(110 CFM)
21" wide x 36" high

CerroZone In-Ceiling
(110 CFM)
48" x 24"

ETL LISTED INTERTEK C US · intertek · CALIFORNIA AIR RESOURCES BOARD · FDA 510(k) · UNITED STATES ENVIRONMENTAL PROTECTION AGENCY · OSHA Occupational Safety and Health Administration · ASHRAE · MARMON A Berkshire Hathaway Company

Engineered for Commercial Real Estate

CerroZone, LLC
A Marmon / Berkshire Hathaway Company
www.CerroZone.com

Written testimony by Dr. Lucky Tran for NYC Council Committee on Health (Wednesday, September 27, 2023):

Improving Indoor Air Quality to Protect New Yorkers from Climate Change and COVID

Hello,

My name is Dr. Lucky Tran, and I am a scientist and public health communicator who works at Columbia, I am a member of the COVID Advocacy NY, and I am a climate justice organizer who has attended several UN climate meetings.

I am writing in support of bills Int 1127-2023, Int 1128-2023, Int 1129-2023, and Int 1130-2023. I also encourage you to strengthen these bills by ensuring actions in response to bad air quality are taken sooner and there are stronger and more actionable regulatory standards.

We are in a climate emergency. We are experiencing the hottest days on record, one in a thousand year floods, and world-leading levels of air pollution. This isn't a once off. The science tells us that things will continue to get worse.

The wildfire smoke we experienced this summer is harmful. And let's get this right, it's not just "the vulnerable" at risk. WE ARE ALL at risk. The small particles found in polluted air can cause serious acute AND long-term health issues like heart damage, lung damage, and possibly even cancer. The climate crisis is a public health crisis.

The government needs to provide resources to protect people from the dangers of smoke and air pollution. And one of the most important things you can do is to improve indoor air quality. This means installing air quality monitors in residential buildings, schools, businesses, government buildings and more, setting regulatory standards for indoor air quality, updating buildings so they have high quality indoor air, and rolling out a long-term public education campaign. These bills are a good start.

Improving indoor air quality is also critical for reducing the harmful health impacts of airborne viruses like COVID, the flu, and RSV. COVID is still around at high levels throughout the year, causing death and chronic illness. This threat is amplified in winter when everyone is indoors and flu and RSV levels also surge. Monitoring and improving indoor air quality will not only help protect us against the many pathogens that are currently circulating, but also increase New York's preparedness and resilience for the next pandemic.

Installing indoor air quality monitors and providing that real-time information transparently to the public is an equity issue. People who are at high risk for severe COVID and people who have respiratory health issues need to be able to assess how safe the air is in indoor public spaces.

Data such as CO2 levels and PM2.5 levels are easy to understand and allow anyone to quickly assess the COVID transmission risk, or air quality risk of any room. It is important that the city invests in infrastructure to display these data. Without it, many of our most vulnerable are being excluded from public spaces because there is no easy way to assess risks. Places like Korea, Taiwan, Belgium, Spain, and Massachusetts have successfully implemented indoor air quality monitoring and standards, it is inexcusable that New York is lagging behind.

Climate change is one of the biggest public health threats of our time. We are at risk of future pandemics like COVID. It would be absolutely reckless to ignore these threats and think that we don't need to make any big changes. We can't afford to go through more cycles of panic, neglect, panic, neglect.

We need a long-term and consistent game plan for climate change and pandemics. We need our public health policies to reflect that we are living in an emergency.

Thank you!

Dr. Lucky Tran
Columbia University and COVID Advocacy Initiative NY

COLUMBIA UNIVERSITY
IN THE CITY OF NEW YORK

V. Faye McNeill, Ph.D., Professor and Vice Chair, Chemical Engineering and Professor, Earth and Environmental Sciences, Columbia University

Written Testimony for the City Council Committee on Health regarding Indoor Air Quality

September 29, 2023

I am writing in my capacity as an expert in indoor air quality and aerosol science and engineering who has studied ventilation in New York City buildings, in support of Int-1027-2023, Int-2028-2023, Int-2029-2023, and Int-2030-2023.

Good indoor air quality is essential for keeping New Yorkers healthy. On average, we spend more than 80% of our time indoors. Elevated levels of pollutants, including carbon dioxide, in indoor air are associated with negative health and education outcomes.

Adequate ventilation is essential to maintaining good indoor air quality and a healthy indoor environment. Ventilation prevents the buildup of pollutants indoors. Ventilation also has well-documented benefits for reducing the transmission of airborne infectious diseases. A correlation between improvements in ventilation and air filtration in schools and lower rates of COVID-19 incidence has been shown.

National guidelines exist for ventilation and air filtration standards that would achieve both good indoor air quality and reduced transmission of infectious diseases in indoor environments. However, adequate data do not exist to evaluate the ventilation and indoor air quality in most New York buildings, making indoor air quality management impossible. Collecting data on pollutant levels and ventilation in buildings is an essential first step towards creating a healthy environment for all New Yorkers. Int-1027-2023, Int-2028-2023, Int-2029-2023, and Int-2030-2023 propose the collection of indoor air quality data in commercial, residential, and city-owned buildings as well as schools in New York. Sharing indoor air quality data publicly, as is planned for city-owned buildings, and with families of school children, will increase awareness of indoor air quality and lead to greater community trust and civic engagement. Sharing this data with research community will enable the development of improved strategies for improved indoor air quality and healthy buildings.

In summary, I encourage the adoption of Int-1027-2023, Int-2028-2023, Int-2029-2023, and Int-2030-2023 in support of public health in New York City.

Concerned Health Professionals of New York is a program of the Science and Environmental Health Network

September 27, 2023

Subject: Proposed bills for indoor air quality: Int 1127-2023; Int 1128-2023; Int 1129-2023; Int 1130-2023

Dear Chairperson Schulman and Council Member Powers,

Thank you for the opportunity to provide input on the proposed bills (#1127, #1128, #1129, #1130) that aim to improve and standardize indoor air quality in schools and municipal buildings and establish pilot programs to monitor indoor air quality in residential and commercial buildings.

These comments on the proposed bills are submitted on behalf of Concerned Health Professionals of New York, an initiative by health professionals, scientists, and medical organizations for raising science-based concerns about the impacts of fracking and its infrastructure on public health and safety. We have recently added to our focus the health threats that the combustion of fracked gas inside homes—via kitchen stoves, hot water heaters, and furnaces—creates.

Whatever the source, indoor air quality is linked with serious health issues and it is past time to address this problem head-on. Indoor air pollution has been consistently ranked as one of the top five environmental risks to public health in the United States. The average American spends about 90% of their time indoors, where some pollutant levels are two to five times higher than typical outdoor levels. As we now know, the use of combustion appliances such as gas stoves leads to even higher levels of pollutants, including nitrogen dioxide and carbon monoxide, as well as volatile vapors, such as benzene, a carcinogen for which there is no safe level of exposure. Exposure to these various contaminants increases the risk of respiratory issues, hospital visits, absences from school and work, and serious conditions like heart disease, stroke, and cancer, as well as worsening existing cases of asthma, itself a serious childhood epidemic in urban America.

We need to protect children, the elderly, and low resource groups from their heightened risk of indoor air pollution and its impacts. We cannot afford to continue risking childhood health and development, harming our elders, and perpetuating environmental injustices. Low socio-economic status households tend to experience poorer indoor air quality and live in homes that are smaller, less well-ventilated, contain aging, less-efficient appliances, and are closer to outdoor air pollution sources, all of which lead to higher indoor pollutant concentrations. We must prioritize indoor air quality solutions for these communities and correct these injustices.

As a statewide group of health professionals, it is inspiring to see New York City leading the way to better indoor air quality, which will have major benefits for city residents as well as setting an example for other municipalities and all levels of government. Adequate policy does not yet exist to regulate indoor air pollutants. With these bills, New York City can set a leadership example in moving to protect its residents from indoor air contamination and its health impacts as well as learn more about this critical risk factor in public health.

The bills:

Indoor Air Quality in Schools
The proposed standard for indoor air quality in schools outlined in bill #1127 will protect student health. Healthy indoor air is crucial for school buildings, where students spend about 1,000 hours per year and where conditions influence the health of children and all those present. These impacts on students can impact cognitive performance and lead to further health effects over their life course.

Indoor Air Quality in City Buildings
The proposed standard for indoor air quality in city buildings outlined in bill #1130 will have health and work performance benefits for the over 300,000 city employees as well as other members of the public who have occasion to be in the buildings. Poor indoor air quality has been shown to impact cognitive function, work performance, and absenteeism. Avoiding these impacts can improve the health of a large swatch of city residents while improving employee comfort, satisfaction, and productivity.

Indoor Air Quality Data in Residential and Commercial Buildings
By collecting additional data on indoor air pollutants and setting standards in residential and commercial buildings, the pilot programs proposed in bills #1128 and #1129 will add to our existing knowledge base and allow further data-based action. New York City's buildings vary tremendously with regard to age, proximity to outdoor pollution sources, type of fuel used, energy performance, and other factors that influence indoor air quality. Additionally, in the continuing era of COVID-19, the pilot programs respond to public concern about indoor air quality and infectious disease.

As mentioned above, nitrogen oxides (NO_x) are a particular concern in indoor air and including those compounds will greatly strengthen the proposed bills. In addition to the proposed pollutant list in the bills, NO_x, a group of toxic gases including nitrogen dioxide (NO_2)

and nitric oxide (NO), should be included due to the association of NO_2 exposure with adverse health impacts as well the role of NO_x in the formation of other health harming pollutants such as ozone (O_3) and fine particulate matter ($PM_{2.5}$). NO_2 is a criteria pollutant, with exposure at even low levels associated with a range of harmful effects on the lungs, heart, prenatal development, and, likely associated with increased risk of kidney and neurological harm, autoimmune issues, and cancer.

Indoor air quality data collection and appropriate standards are required for a healthier population overall and to reduce environmental injustices. The proposed bills are very important steps in this direction. My colleagues and I thank you for the opportunity to provide comment.

Sincerely,

Carmi Orenstein, MPH
Program Director

September 27, 2023 - Delos Testimony - Committee on Public Health

We spend up to 90% of our lives indoors. These indoor spaces, especially our homes, offices and schools, have a profound impact on our acute and chronic health and play a significant role in overall health care costs. A key contributing factor to health outcomes in indoor spaces is air quality. Indoor air quality can be two to five times worse than outdoor air quality; pathogen transmission concerns, particulate concerns from increased traffic and industrial equipment emissions, particulate concerns from wildfire smoke, or even particulate and volatile compound related concerns caused by human activities like cooking and smoking indoors, all contribute to indoor air quality issues. The short and long-term health impacts of these environmental challenges are clear and many studies have tied the cost of human exposure to indoor air pollutants to significant economic related productivity loss as well as increased health care costs.

As such, Delos is highly supportive of the recent bills introduced, INT 1127, INT 1128, INT 1129 and INT 1130, which seek to take a data-centric approach to quantify indoor air quality within certain commercial, residential, city and school buildings. By taking a data-centric approach, appropriate infrastructure, policy and behavioral changes can be made to better the health and well-being of the New York City residents, employees and students that occupy these spaces.

Delos has recently worked with the State of Kansas Department of Health to implement air quality sensors at schools statewide to quantify air quality metrics and better inform infrastructure improvements, funding allocation and policy decisions. Delos has utilized its building science research team to evaluate Kansas schools, work closely with the Kansas Department of Health to identify program goals and outcomes, and subsequently design and implement a sensor program to collect accurate and representative data across schools. Delos is deploying over 2,500 sensors across more than 400 Kansas schools, a process that first started with a pilot program at a limited set of schools to prove the value of deployed sensors and data collected. **Delos has submitted a proposal for a pilot program to be performed in collaboration with the New York City Department of Education and with the New York City Housing Authority and stands ready to support the City of New York in addressing indoor air quality.**

Delos is the pioneer of the healthy buildings movement, having researched the health impacts of indoor environments for over a decade. Delos has reviewed hundreds of health and wellness products in the market utilizing a science-based approach to evaluate the performance and impact on human health outcomes. Through testing and data collection, insights evaluation and the deployment of scientifically proven health and wellness technologies, Delos offers its experience and expertise and encourages a collaboration with New York City to implement air quality monitor pilot programs in an effort to inform and create healthier spaces.

Sincerely,

Paul Scialla

Icahn School of Medicine at Mount Sinai
Children's Environmental Health Center

Children's Environmental Health Center
Department of Environmental Medicine and Public Health
Icahn School of Medicine at Mount Sinai
One Gustave L. Levy Place, Box 1217
New York, NY 10029-6574

September 27, 2023

Subject: Proposed bills for indoor air quality: Int 1127-2023; Int 1128-2023; Int 1129-2023; Int 1130-2023

Dear Chairperson Schulman, Council Member Powers, and Honorable Members of the Committee on Health:

Thank you for the opportunity to provide input on the proposed bills (#1127, #1128, #1129, #1130) that aim to standardize and improve indoor air quality in schools and municipal buildings and establish pilot programs to monitor indoor air quality in residential and commercial buildings.

We submit these comments on behalf of our team of pediatricians, occupational and environmental medicine physicians, nurses, and scientists with expertise in environmental health. We work together to educate families and communities on how to create safer environments and reduce exposures to harmful air pollutants. We strongly support initiatives that protect the youngest and most vulnerable from the harms of these pollutants.

As recognized experts in children's environmental health, we receive frequent inquiries from patients and families who are impacted by poor indoor air quality (IAQ) in their homes, schools, and places of work. The measures proposed by these bills would improve IAQ and have far-reaching effects on the health of all New Yorkers.

Poor indoor air quality affects everyone. Indoor air is amongst the top five environmental risks to public health according to the United States Environmental Protection Agency (EPA), estimated to be responsible for 3.2 million deaths worldwide in 2020, including over 237,000 deaths of children under the age of 5.[1,2] The health effects of poor IAQ range from coughing, headaches, and eye irritation to respiratory, cognitive, and cardiovascular effects.[3,4,5] Studies show direct links between specific indoor air contaminants and health outcomes; examples include particulate matter and asthma, radon and cancer, and carbon monoxide and death.[3] In addition to direct impacts on health, poor IAQ negatively affects the economy through decreased worker productivity and lost days of work and impacts educational attainment through missed school days [4,5,6,7,8]

---

[1] United States Environmental Protection Agency. Why Indoor Air Quality is Important to Schools. Accessed September 25, 2023. https://www.epa.gov/iaq-schools/why-indoor-air-quality-important-schools
[2] https://www.who.int/news-room/fact-sheets/detail/household-air-pollution-and-health
[3] Hoskins JA. Health Effects Due to Indoor Air Pollution. In: Gökçekus H, Türker U, LaMoreaux JW, eds. Survival and Sustainability: Environmental concerns in the 21st Century. Springer Berlin Heidelberg; 2011:665-676.
[4]United States Environmental Protection Agency. Indoor Air Quality: What are the trends in indoor air quality and their effects on human health? Accessed September 25, 2023. https://www.epa.gov/report-environment/indoor-air-quality.
[5] Laurent JGC, MacNaughton P, Jones E, et al. Associations between Acute Exposures to PM(2.5) and Carbon Dioxide Indoors and Cognitive Function in Office Workers: A Multicountry Longitudinal Prospective Observational Study. *Environ Res Lett*. Sep 2021;16(9)doi:10.1088/1748-9326/ac1bd8.
[6] United States Environmental Protection Agency. An Office Building Occupants Guide to Indoor Air Quality. Accessed September 25, 2023. https://www.epa.gov/indoor-air-quality-iaq/office-building-occupants-guide-indoor-air-quality
[7] Lu W, Hackman DA, Schwartz J. Ambient air pollution associated with lower academic achievement among US children: A nationwide panel study of school districts. *Environ Epidemiol*. Dec 2021;5(6):e174. doi:10.1097/EE9.0000000000000174.
[8] Hsu J, Qin X, Beavers SF, Mirabelli MC. Asthma-Related School Absenteeism, Morbidity, and Modifiable Factors. *Am J Prev Med*. Jul 2016;51(1):23-32. doi:10.1016/j.amepre.2015.12.012

Icahn School of Medicine at Mount Sinai
Children's Environmental Health Center

Children's Environmental Health Center
Department of Environmental Medicine and Public Health
Icahn School of Medicine at Mount Sinai
One Gustave L. Levy Place, Box 1217
New York, NY 10029-6574

Importantly, these health impacts can be mitigated by establishing standards and air monitoring to inform targeted improvements to building conditions. With the average American spending around 90% of their time indoors where pollutant levels can be two to five times higher than typical outdoor levels, *policy measures that optimize IAQ will improve the health of City residents and workers in myriad ways.*[9,10]

Indoor air pollution is associated with health inequities. The burden of poor IAQ falls disproportionately on sensitive groups including children, those with chronic conditions, and low-income and Black and brown communities. Data from the NYC Department of Health and Mental Hygiene shows that substandard housing and maintenance issues that impact indoor air are more common in predominantly Black and brown communities.[11] For example a higher percentage of residents in East Harlem, where our Center is situated, report maintenance problems, carbon monoxide incidents, and other housing issues that impact air quality residents of other neighborhoods.[11] Recent studies find that students of color are also more likely than white students to be exposed to air pollutants at school.[12,13] Such inequities contribute to the high rates of asthma and school absenteeism observed in Black and Hispanic children in New York City and elsewhere.

Children are especially vulnerable to indoor air pollution. Children are not "tiny adults"; their higher breathing rates place them at increased risk for inhalational exposures compared with adults, and their rapidly growing organ systems are more susceptible to harm from air pollutants.[14] Air pollutants can cause asthma, airway inflammation, decreased lung function, a reduction in response to asthma rescue medications, as well as worsen asthma.[15,16] Air pollutants can also penetrate deep into children's lungs where they can enter the bloodstream to affect multiple bodily systems.[17] This can lead to an increased risk of learning and behavioral problems, autism, dementia, obesity and diabetes, heart attack and stroke, more severe COVID-19 outcomes, poor pregnancy outcomes, and lower life expectancy.[18,19] Thus, exposures experienced during childhood can contribute to cumulative health impacts over a lifetime.

---

[9] United States Environmental Protection Agency. *Report to Congress on Indoor Air Quality: Volume 2*. EPA/400/1-89/001C. Washington, DC. 1989.
[10] United States Environmental Protection Agency. *The Total Exposure Assessment Methodology (TEAM) Study: Summary and Analysis.* EPA/600/6-87/002a. Washington, DC. 1987.
[11] https://a816-dohbesp.nyc.gov/IndicatorPublic/beta/neighborhood-reports/east_harlem/housing_and_health/
[12] Grineski Sarah E and Thomas W Collins, Geographic and social disparities in exposure to air neurotoxicants at U.S. public schools, Environmental Research, Volume 161, 2018, Pages 580-587,ISSN 0013-9351, https://doi.org/10.1016/j.envres.2017.11.047.
[13] Cheeseman, et al. Disparities in Air Pollutants Across Racial, Ethnic, and Poverty Groups at US Public Schools. GeoHealth. Volume 6, Issue12, December 2022, e2022GH000672
[14] Bearer CF. The special and unique vulnerability of children to environmental hazards. *Neurotoxicology*. Dec 2000;21(6):925-34.
[15] Tiotiu AI, Novakova P, Nedeva D, et al. Impact of Air Pollution on Asthma Outcomes. *Int J Environ Res Public Health*. Aug 27 2020;17(17)doi:10.3390/ijerph17176212.
[16] Nishimura KK, Galanter JM, Roth LA, et al. Early-life air pollution and asthma risk in minority children. The GALA II and SAGE II studies. *Am J Respir Crit Care Med*. Aug 1 2013;188(3):309-18. doi:10.1164/rccm.201302-0264OC
[17] World Health Organization. Air Quality and Health. Accessed September 25, 2023. https://www.who.int/teams/environment-climate-change-and-health/air-quality-and-health/health-impacts.
[18] Manisalidis I, Stavropoulou E, Stavropoulos A, Bezirtzoglou E. Environmental and Health Impacts of Air Pollution: A Review. *Front Public Health*. 2020;8:14. doi:10.3389/fpubh.2020.00014
[19] Marques M, Domingo JL. Positive association between outdoor air pollution and the incidence and severity of COVID-19. A review of the recent scientific evidences. *Environ Res*. Jan 2022;203:111930. doi:10.1016/j.envres.2021.111930

Icahn School of Medicine at Mount Sinai
Children's Environmental Health Center

Children's Environmental Health Center
Department of Environmental Medicine and Public Health
Icahn School of Medicine at Mount Sinai
One Gustave L. Levy Place, Box 1217
New York, NY 10029-6574

Healthy indoor air is especially important in school buildings, where students spend about 1,000 hours per year, yet poor IAQ in school buildings and childcare facilities is a pervasive problem.[20] A national survey performed administered by the Government Accountability Office found that 41% of public school districts had over half of their schools needing renovations to their heating, ventilation, and air conditioning systems.[21] Lack of ventilation in school buildings contributes to greater exposure to indoor air pollutants, mold growth, and increased spread of infectious airborne pathogens.[19] These poor building conditions can exacerbate asthma, the leading cause of chronic disease-related school absenteeism in the U.S., associated with >10 million missed school days annually.[7]

The proposed standards for IAQ in schools outlined in bill #1127 are a major step towards improving child health and well-being. A study of 100 U.S. schools found measurable progress in math and reading scores when IAQ was improved, highlighting a direct association between student academic achievement and classroom ventilation rates.[22,23] In addition, schools that took steps to improve ventilation had up to 39% lower COVID-19 incidence during the height of the pandemic.[24]

Indoor air standards are needed to improve the health of city workers and residents. The proposed standards for IAQs in city buildings outlined in bill #1130 will have widespread health benefits for over 300,000 city employees as well as building visitors.[25] IAQ standards are particularly important for adults with respiratory issues such as asthma and chronic obstructive pulmonary disease (COPD) who are more vulnerable to health impacts of poor IAQ. [26] Pregnant women and women of childbearing age are also at risk, with numerous studies showing associations between maternal exposure to ambient air pollutants and risk of adverse birth outcomes, congenital heart disease, autism, and childhood asthma.[27,28]

Our Center commonly receives inquiries from families whose health conditions are exacerbated by poor indoor air quality. The absence of indoor air standards and lack of data about indoor air pollutant levels makes it challenging to address these concerns. The proposed pilot air monitoring programs will help identify factors that influence indoor air quality and provide much-needed data about indoor air quality across the city. In the wake of the COVID-19 pandemic, we have seen a rise in concerns from patients and

---

[20] Desilver D. School Days: How the U.S. Compares with Other Countries. Pew Research Center. Accessed September 25, 2023. https://www.pewresearch.org/short-reads/2014/09/02/school-days-how-the-u-s-compares-with-other-countries/.
[21] GAO Highlights. K-12 Education School Districts Frequently Identified Multiple Systems Needing Updates or Replacement United States Government Accountability Office. Accessed September 25, 2023. https://www.gao.gov/assets/gao-20-494.pdf.
[22] National Education Association. Addressing Indoor Air Quality in Schools. Accessed September 25, 2023. https://www.nea.org/resource-library/addressing-indoor-air-quality-schools.
[23] Haverinen-Shaughnessy U, Moschandreas DJ, Shaughnessy RJ. Association between substandard classroom ventilation rates and students' academic achievement. *Indoor Air*. Apr 2011;21(2):121-31. doi:10.1111/j.1600-0668.2010.00686.x.
[24] https://www.cdc.gov/mmwr/volumes/70/wr/mm7021e1.htm
[25] Doulis M. The Growth of NYC Employee Headcount. Citizens Budget Commission. 2020. https://cbcny.org/research/growth-nyc-employee-headcount.
[26] Jiang XQ, Mei XD, Feng D. Air pollution and chronic airway diseases: what should people know and do? *J Thorac Dis*. Jan 2016;8(1):E31-40. doi:10.3978/j.issn.2072-1439.2015.11.50.

[27] Sun, J., Wang, J., Yang, J. *et al.* Association between maternal exposure to indoor air pollution and offspring congenital heart disease: a case–control study in East China. *BMC Public Health* **22**, 767 (2022). https://doi.org/10.1186/s12889-022-13174-0
[28] Flanagan, E., Malmqvist, E., Rittner, R. *et al.* Exposure to local, source-specific ambient air pollution during pregnancy and autism in children: a cohort study from southern Sweden. *Sci Rep* **13**, 3848 (2023). https://doi-org.eresources.mssm.edu/10.1038/s41598-023-30877-5

Icahn School of Medicine at Mount Sinai
Children's Environmental Health Center

Children's Environmental Health Center
Department of Environmental Medicine and Public Health
Icahn School of Medicine at Mount Sinai
One Gustave L. Levy Place, Box 1217
New York, NY 10029-6574

families about indoor air quality. These pilot programs will empower New York City communities with data about the environments in which they live and work.

With the proposal of these bills, New York City has the opportunity to pave the way for cities across the United States in prioritizing indoor air quality and improving health, particular for the most vulnerable.

We applaud measures to protect the health of New Yorkers by improving indoor air quality, and are grateful for the opportunity to share our perspective on this important legislation.

Thank you for your time and attention,

Sarah Evans, PhD MPH
Assistant Professor
Environmental Medicine & Public Health.

Perry Sheffield, MD MPH FAAP
Associate Professor
Environmental Medicine & Public Health.

Maida Galvez, MD MPH FAAP
Professor
Environmental Medicine & Public Health
Pediatrics

Lauren Zajac, MD MPH FAAP
Associate Professor
Environmental Medicine & Public Health
Pediatrics
Medical Director, Environmental Pediatrics

Luz Guel
Director of Community Engagement & EJ
Environmental Medicine & Public Health

Hannah Thompson, MD MPH
Assistant Professor
Environmental Medicine & Public Health

Oversight: Protecting New Yorkers from Heat and Air Quality Emergencies

Long COVID Justice NYC ("LCJ-NYC") is a group of New Yorkers living with Long COVID and associated disease (LCAD). The group's mission is to improve and expand related policies and programs through advocacy, media efforts, education and cultural events. LCJ-NYC would like to thank the Committees on Health and Fire and Emergency Management for convening this critical hearing on air quality standards, monitoring and reporting. We note that this topic is incredibly timely, as the ongoing COVID pandemic has made it clear that more must be done in order for us to truly "live with COVID"; and a key step will be improving air quality.

Background on Long COVID

Long COVID (or post-acute sequelae of SARS-CoV-2) is an illness that can develop in children, adults, and seniors after a probable or confirmed case of COVID-19, and can last months or even years. Long COVID can occur following infection of SARS-CoV-2 regardless of severity of acute presentation, including in people who were asymptomatic, and in those who have been vaccinated.

According to the most recent Household Pulse Survey[1] conducted by the National Center for Health Statistics in conjunction with the Census Bureau, almost 18% of all adults in New York State have experienced Long COVID, including almost 30% of all adults who have ever had COVID. Many New Yorkers are experiencing activity limitation as a result of Long COVID: Of all adults living in New York, nearly 7% (almost 1,115,000 people) are currently experiencing activity limitation, and 1.9% have significant activity limitation (almost 307,000 people). Note all of these numbers have increased since the last time LCJ-NYC submitted testimony just a few months ago, evidencing the urgency and persistence of this issue. In New York City, the NYC Department of Mental Health and Hygiene estimated in June 2022 that approximately 30% of all New Yorkers who have ever had COVID also have Long COVID.[2]

Importance of Air Quality

LCJ-NYC strongly supports improved air quality for two main reasons. First, the best way to prevent Long COVID is to prevent COVID, and improved air quality has been shown to significantly reduce COVID transmission rates.[3] Second, a COVID reinfection, while widely damaging to all, can be particularly devastating to people with Long COVID (also known as "longhaulers"). Therefore, to avoid reinfection, many people with Long COVID must avoid poorly

[1] https://www.cdc.gov/nchs/covid19/pulse/long-covid.htm
[2] https://www.nyc.gov/assets/doh/downloads/pdf/covid/providers/letter-long-covid.pdf
[3] Improved ventilation can reduce the spread of COVID: COVID Transmission reduced by 82.5% when mechanical ventilation producing 6 air changes per hour was implemented (https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/Improving-Ventilation-Home.html)

ventilated public spaces where reinfection risks are high; thus, improved ventilation would allow longhaulers to participate in public life and access needed services.

Commentary

With the above in mind, LCJ-NYC writes in support of and urges the passage of Int. 1127-2023, Int. 1128-2023, Int. 1129-2023 and Int. 1130-2023 with the following caveats:

With respect to Int. 1127-2023 and 1130-2023, LCJ-NYC respectfully submits that the rulemaking deadline be accelerated from 18 months to a shorter period, given that there is a plethora of existing air quality standards from the CDC (for buildings[4] and schools[5]) and other organizations[6], that could easily be customized for New York City schools and buildings. It is imperative that improved air quality standards be implemented as soon as possible. 18 months is too long to wait, as that allows for too many potential new cases of COVID and Long COVID in New York CIty that could potentially be avoided through improved air quality.

With respect to Int. 1128-2023 and 1129-2023, LCJ-NYC respectfully requests that the bills be amended to require measurement of air changes per hour (or, at minimum, further specify the definition of "practicable" so as to maximize the implementation of measurements). Measurement of air changes per hour is a critical, and relatively easy to understand, metric for understanding and assessing air quality; LCJ-NYC encourages its usage to create an accessible metric for collecting accurate air quality data.

Once again, LCJ-NYC thanks the Committees for the opportunity to testify regarding the issue of air quality. As both the COVID pandemic and wildfire emergencies have continued to demonstrate, poor air quality and a lack of management and mitigation measures in public spaces have detrimental effects on the health and wellbeing of city residents. It is imperative that the city take proactive steps to address these ongoing crises.

---

[4] https://www.cdc.gov/coronavirus/2019-ncov/community/ventilation.html
[5] https://www.cdc.gov/coronavirus/2019-ncov/community/schools-childcare/index.html
[6] For more information, see this discussion of various recommendations and standards by Indoor Aircare Advocates (https://www.iaqadvocates.org/post/ranking-recommendations-rationally)

September 15, 2023

RMI (previously Rocky Mountain Institute)
17 State St, 25th Floor, Unit 2500
New York, NY 10004
(315) 266-9600

Written testimony submitted to New York City Council, Committee on Health, via https://council.nyc.gov/testify/

Subject: RMI Comments on Proposed Bills Int 1127-2023, Int 1130-2023, Int 1129-2023, Int 1128-2023

Dear Chairperson Schulman and Council Member Powers,

RMI respectfully submits this comment regarding the proposal to standardize indoor air quality in schools and city buildings (Int 1127-2023, Int 1130-2023), and to monitor and measure indoor air quality in certain residential and commercial buildings (Int 1128-2023, Int 1129-2023). RMI is a nonpartisan, non-profit organization that works to transform global energy systems.

We highlight four specific areas of the proposed bills and respectfully provide additional rationale and details as decisionmakers finalize bills #1127, #1128, #1129 and #1130. Our comments address the following:

1. New York City is leading the way to protect indoor air, and these bills will spur major benefits for city residents.
2. The proposed bills address heightened concerns over indoor air quality.
3. Poor indoor air quality is a serious health threat in all buildings, necessitating protective measures such as standards and pilot programs.
4. Including the monitoring and standardization of nitrogen oxides (NO_x) will reflect the best available science and strengthen the proposed bills by maximizing air pollution reduction and human health benefits.

Protecting indoor air quality (IAQ) will limit outbreaks or epidemics, reduce exposure to health-harming toxins and pollutants, safeguard against environmental hazards (such as wildfires and outdoor air pollution), and lower risks of respiratory conditions like childhood asthma.[1] Despite these extensive benefits, indoor air remains largely unprotected by federal and most state

[1] Xiaolei Gao et al., "Building Ventilation as an Effective Disease Intervention Strategy in a Dense Indoor Contact Network in an Ideal City," ed. Jeffrey Shaman, *PLOS ONE* 11, no. 9 (September 9, 2016): e0162481, https://doi.org/10.1371/journal.pone.0162481, "New Study Funds Ventilation Significantly Reduces Indoor Pollutant Levels and Adds New Evidence for Eliminating Gas Stoves," National Center for Healthy Housing, April 13, 2022, https://nchh.org/2022/04/new-study-finds-ventilation-significantly-reduces-indoor-pollutant-levels-and-adds-new-evidence-for-eliminating-gas-stoves/, Kyle Cooke, Alexis Kikoen, and Jeremy Moore, "Will Building Better Help Us Weather the Future? Marshall Fire Victims Hope So.," Rocky Mountain PBS, April 10, 2023, https://www.rmpbs.org/blogs/news/passive-house-marshall-fire-climate-crisis/, [1] Weiwei Lin, Bert Brunekreef, and Ulrike Gehring, "Meta-Analysis of the Effects of Indoor Nitrogen Dioxide and Gas Cooking on Asthma and Wheeze in Children," *International Journal of Epidemiology* 42, no. 6 (August 20, 2013): 1724–37, https://doi.org/10.1093/ije/dyt150.

legislatures. The COVID pandemic, increasingly frequent catastrophic wildfire events across the country, and a growing body of research highlighting the proliferation of polluting indoor sources have renewed an urgency to understand and address health risks indoors. With the average American spending approximately 90% of their time indoors, where the concentration of some pollutants are often two to five times higher than typical outdoor concentrations, New York City has an opportune venue to advance air quality protections that will have far reaching health benefits for its communities.[2]

1. **New York City is leading the way to protect indoor air and these bills will spur major benefits for city residents.**

With the proposal of these bills, New York City is poised to establish a first-of-its-kind comprehensive indoor air quality standard for key pollutants across multiple building types. While few indoor air protective policies currently exist across the U.S., these bills show leadership from New York City to address indoor air pollution that can serve as a model for other cities. Policies to protect indoor air have major potential to save lives, improve health outcomes, and benefit the economy. As evidenced by the success of the US Clean Air Act for outdoor air pollutants, improved air quality decreases respiratory illness cases, absences from school and work, emergency room visits, and mortality rates.[3] The benefits of the Clean Air Act outweigh costs by 30 to 1, with $2 trillion in avoided health costs.[4] By addressing air pollutants indoors, New York City will set additional benefits in motion for New Yorkers.

2. **The proposed bills address heightened concerns over indoor air quality.**

The proposed bills address current public concern around indoor air quality and align with growing scientific literature on the extensive benefits of healthy indoor air. We present the following points for consideration to further communicate the importance and transformative opportunity of monitoring and regulating indoor air quality.

COVID pandemic

The COVID pandemic has revived interest in the role air quality can play in fighting infectious diseases, and conversely, how damaging a communicable, airborne infection can be when poorly managed.

Unsurprisingly, inadequate ventilation or air handling in enclosed spaces – within which "the concentration of exhaled respiratory fluids, especially very fine droplets and aerosol particles, can build-up in the air space"– significantly increase the risk of transmission in indoor

[2] US Environmental Protection Agency, "Why Indoor Air Quality is Important to Schools," 2022, https://www.epa.gov/iaq-schools/why-indoor-air-quality-important-schools.

[3] US Environmental Protection Agency, "Progress Cleaning the Air and Improving People's Health," US Environmental Protection Agency, last modified May 1, 2023, https://www.epa.gov/clean-air-act-overview/progress-cleaning-air-and-improving-peoples-health

[4] US Environmental Protection Agency, "Benefits and Costs of the Clean Air Act 1990-2020, the Second Prospective Study," US Environmental Protection Agency, Accessed August 2023, https://www.epa.gov/clean-air-act-overview/benefits-and-costs-clean-air-act-1990-2020-second-prospective-study; and Jason Price et al., *The Benefits and Costs of US Air Pollution Regulations,"* Industrial Economics, Incorporated, May 2020, https://www.nrdc.org/sites/default/files/iec-benefits-costs-us-air-pollution-regulations-report.pdf

environments.[5] Research has demonstrated that systematic air filtration provides the opportunity to use ventilation systems in order to minimize possible contagion risk, as well as the importance of direct monitoring of air quality measures in indoor environments to prevent unexpected viral exposures.[6] Poorly ventilated spaces offer ideal transmission conditions for the coronavirus. In New York City, poorly vented public schools saw 23% more COVID-19 cases for students and 29% more cases for staff compared to well-ventilated buildings as of 2021.[7]

Wildfires and outdoor air pollution

The increased frequency of wildfires raises awareness of the interaction between outdoor air pollution and indoor air quality. Outdoor air can infiltrate buildings even with closed windows through structural cracks and gaps. Studies show that 90% of U.S. homes likely have air leakage where outdoor air comes in.[8] During wildfire events, indoor air quality is worse than on smoke-free days, and staying indoors provides only limited protection from wildfire fine particulate matter ($PM_{2.5}$).[9] Improving indoor air quality will become increasingly important as wildfires continue to increase in prevalence.

Fossil fuel combustion indoors

The effects of using fossil fuel combusting equipment and appliances in buildings continues to be a public health concern, with an ever-growing body of literature identifying the practice to be a contributor to poor indoor air quality. In addition to greenhouse gas emissions, fossil fuel appliances emit many of the same harmful combustion pollutants as car exhaust – carbon monoxide (CO), nitrogen dioxide (NO_2), fine particulate matter ($PM_{2.5}$) and formaldehyde. Exposure to fossil fuel appliance pollution is connected to a wide variety of acute and chronic negative health outcomes that span respiratory illness, cardiovascular disease, poor birth outcomes, and adverse childhood development.[10]

The unequal burden of poor indoor air quality

Literature evaluating socio-economic determinants of indoor pollutant concentrations has demonstrated that households that are low-income generally experience poorer indoor air quality.[11] Low-income and disadvantaged communities typically live in older homes that are

---

[5] Prisco Piscitelli et al., "The role of outdoor and indoor air quality in the spread of SARS-CoV-2: Overview and recommendations by the research group on COVID-19 and particulate matter (RESCOP commission)," *Environmental Res.*, August 2022, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8881809/

[6] "The role of outdoor and indoor air quality in the spread of SARS-CoV-2: Overview and recommendations by the research group on COVID-19 and particulate matter (RESCOP commission)," 2022.

[7] Nsikan Akpan and Jaclyn Jeffrey-Wilensky, "NYC Schools Bought Weaker Air Purifiers, Now Underventilated Campuses Are More Prone to COVID Cases," Gothamist, November 18, 2021, https://gothamist.com/news/nyc-schools-bought-weaker-air-purifiers-now-underventilated-campuses-are-more-prone-covid-cases

[8] Wanyu R. Chan, Jeffrey Joh, and Max H. Sherman, "Analysis of Air Leakage Measurements of US Houses," *Energy and Buildings* 66 (November 2013): 616–25, https://doi.org/10.1016/j.enbuild.2013.07.047.

[9] Katelyn O'Dell et al., "Outside In: The Relationship between Indoor and Outdoor Particulate Air Quality during Wildfire Smoke Events in Western US Cities," *Environmental Research: Health* 1, no. 1 (November 1, 2022): 015003, https://doi.org/10.1088/2752-5309/ac7d69.

[10] Yu Ann Tan and Bomee Jung, *Decarbonizing Homes: Improving Health in Low-Income Communities through Beneficial Electrification,* RMI, 2021, http://www.rmi.org/insight/decarbonizing-homes.

[11] Lauren Ferguson et al., "Exposure to indoor air pollution across socio-economic groups in high-income countries: A scoping review of the literature and a modelling methodology," *Environment International,* October 2020, https://doi.org/10.1016/j.envint.2020.105748

smaller in size, have inadequate mechanical ventilation and contain aging combustion appliances with less efficient operation, and are closer to outdoor air pollution sources, resulting in higher indoor pollutant concentrations. In situations where heat in a household is insufficient, kitchen appliances are sometimes used as an alternative, which has been shown to increase time-weighted exposures to CO and NO_2.[12] Lower-income and BIPOC residents are disproportionately impacted by poor air quality. People of color in New York are exposed to 49% more $PM_{2.5}$ from residential gas appliances in buildings than whites.[13] Given the realities of poor indoor air quality and disparate health impacts that manifest along socioeconomic lines, it is imperative to prioritize improving indoor air quality in these communities by offering accessible and effective solutions.

3. **Poor indoor air quality is a serious health threat in all buildings, necessitating protective measures such as standards and pilot programs.**

The EPA has consistently ranked indoor air pollution among the top five environmental risks to public health.[14] Exposure to indoor air pollution can contribute to respiratory issues, hospital visits, absences from school and work, and serious conditions like heart disease, stroke, and cancer.[15] In addition to causing health impacts, indoor air pollution can make existing health conditions worse, such as asthma.[16] These risks can be even more severe for sensitive groups including children, the elderly and low-socioeconomic status households.[17] The proposed standards in bills #1127 and #1130 and pilot programs in bills #1128 and #1129 provide a comprehensive approach to begin addressing this widespread issue across building types.

Pilot Programs - Data Access

---

[12] "Morbidity and Mortality Weekly Report: Use of Unvented Residential Heating Appliances – United States, 1988-1994," US Centers for Disease Control and Prevention, December 1997, https://www.cdc.gov/mmwr/preview/mmwrhtml/00050535.htm

[13] Christopher W. Tessum et al., "PM2.5 Polluters Disproportionately and Systematically Affect People of Color in the United States," *Science Advances,* Vol. 7, No. 18, 2021, https://doi.org/10.1126/sciadv.v.abf4491

[14] "Why Indoor Air Quality is Important to Schools," US Environmental Protection Agency, Accessed September 2023, https://www.epa.gov/iaq-schools/why-indoor-air-quality-important-schools

[15] World Health Organization, "Household Air Pollution," World Health Organization, November 28, 2022, https://www.who.int/news-room/fact-sheets/detail/household-air-pollution-and-health; and "The Clean Air Act and The Economy," US Environmental Protection Agency, Accessed August 2023, https://www.epa.gov/clean-air-act-overview/clean-air-act-and-economy#:~:text=Fewer%20premature%20deaths%20and%20illnesses,absences%2C%20and%20better%20worker%20productivity.

[16] Weiwei Lin, Bert Brunekreef, and Ulrike Gehring, "Meta-Analysis of the Effects of Indoor Nitrogen Dioxide and Gas Cooking on Asthma and Wheeze in Children," *International Journal of Epidemiology* 42, no. 6 (August 20, 2013): 1724–37, https://doi.org/10.1093/ije/dyt150.

[17] Nicholas Rees, "Clear the Air for Children," United Nations Children's Fund (UNICEF), October 2016, https://www.unicef.org/media/49966/file/UNICEF_Clear_the_Air_for_Children_30_Oct_2016.pdf; Samaneh Dehghani et al., Ecological study on household air pollution exposure and prevalent chronic disease in the elderly, Scientific Reports, July 20, 2023, https://www.nature.com/articles/s41598-023-39059-9; Gary Adamkiewicz et al., "Moving Environmental Justice Indoors: Understanding Structural Influences on Residential Exposure Patterns in Low-Income Communities," Am J Public Health, December 2011, https://doi.org/10.2105%2FAJPH.2011.300119

Access to high quality, current indoor air quality data is essential to success. Indoor air quality data is currently limited for most key pollutants.[18] Routine monitoring and data collection such as that proposed in bills #1128 and #1129 can help build the necessary foundation of data to clarify indoor air quality conditions and the impacts of pollutants. This data helps identify high polluting sources, measure the success of indoor air quality interventions, and better understand qualitative and quantitative benefits of healthy indoor air.[19]

Indoor air monitoring can help ensure healthy, safe spaces. By collecting sufficient data on indoor air pollutants, New York City officials will be able to better identify and address potential health and safety risks. New York City's building stock varies greatly in age, proximity to outdoor pollutant sources, fuel use of indoor equipment, and energy performance, among other factors.[20] Evidence shows that low-income communities often occupy older, lower-performing, more crowded buildings that put them at a greater risk of indoor air pollutant exposure. These pilot programs in residential and commercial buildings will help clarify what factors influence indoor air quality and how to address associated risks efficiently and equitably.

Additionally, these pilot programs bring data directly to New Yorkers. In the wake of COVID, people are concerned about indoor air; in a recent US survey, 91% of US consumers believe indoor air quality is critical to fight infectious disease, and 72% would be likely to use data on a building's indoor air quality if made available.[21] New York City can be among the first to address these national concerns – the proposed pilot programs will give New Yorkers desired clarity of indoor air conditions and assurance to re-enter public spaces.

Standards support students

The data is clear; school buildings are critically important to students' education as students spend about 1,000 hours per year at school, second only to their homes.[22] Evidence shows that healthy school buildings impact childhood health and educational attainment, translating to lifelong effects on health, life expectancy, and socioeconomic status.[23] By establishing a standard for indoor air quality in this critical building type, New York will see benefits to student health, absenteeism rates, and academic performance.

---

[18] "Indoor Air Quality," US Environmental Protection Agency, Accessed September 2023, https://www.epa.gov/report-environment/indoor-air-quality

[19] Dimitrios Bousiotis et al., "Monitoring and apportioning sources of indoor air quality using low-cost particulate matter sensors," Environment International, April 2023, https://doi.org/10.1016/j.envint.2023.107907

[20] "A Stronger More Resilient New York, Chapter 4: Buildings," New York City Government, June 11, 2013, https://www.nyc.gov/assets/sirr/downloads/pdf/Ch4_Buildings_FINAL_singles.pdf

[21] Carbon Lighthouse, "Consumers to Drive U.S. Economic Recovery: 91% Say Indoor Air Quality Critical in Fight Against COVID-19," Markets Insider, October 2020, https://markets.businessinsider.com/news/stocks/consumers-to-drive-u-s-economic-recovery-91-say-indoor-air-quality-critical-in-fight-against-covid-19-1029678721

22 Drew DeSilver, "School Days: How the US Compares with Other Countries," Pew Research Center, 2014, https://www.pewresearch.org/fact-tank/2014/09/02/school-days-how-the-u-s- compares-with-other-countries/.

23 Erika Eitland et al., Schools for Health: Foundations for Student Success, Harvard T. H. Chan School of Public Health, 2017, https://forhealth.org/Harvard.Schools_For_Health.Foundations_for_Student_Success.pdf.

Young children are physiologically more susceptible to health impacts from indoor air pollution exposure.[24] The development or exacerbation of asthma — the most common childhood chronic disease in the United States, affecting more than 6 million children — is a possible outcome.[25] Increasingly, studies link air pollution exposure in school-aged children to non-respiratory chronic disease outcomes, including increased blood pressure and cancer risk.[26] Additionally, airborne viral and bacterial particles may transmit various illnesses. For example, research has demonstrated that incidence of COVID-19 was approximately 40% lower in schools that took steps to improve air quality.[27] Illness related to unhealthy air quality increase the risk of students incurring absences.[28] Asthma is a leading cause of absenteeism, resulting in some 13.8 million missed school days annually.[29]

The proposed indoor air quality standard in bill #1127 can help shield risks and bring in benefits for schools. While unhealthy air quality is linked to significantly reduced academic performance and absenteeism, taking protective measures to increase ventilation rates and decrease CO_2 levels can just as easily improve performance, improve student attendance, and decrease absences.[30]

Standards in city buildings benefit employers and workers

The proposed standard for indoor air quality in city owned buildings outlined in bill #1130 would have widespread benefits for over 300,000 city employees in addition to non-employee building

[24] Philip J. Landrigan et al., "Children's Health and the Environment: Public Health Issues and Challenges for Risk Assessment," Environmental Health Perspectives 112, no. 2 (2004): 257–65, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1241836/; and Joel Schwartz, "Air Pollution and Children's Health," Pediatrics 113, no. Supplement 3 (2004): 1037–43, https://doi. org/10.1542/peds.113.S3.1037.
[25] "The Links Between Air Pollution and Childhood Asthma," US Environmental Protection Agency, 2018, https://www.epa.gov/sciencematters/links-between-air-pollution-and-childhood-asthma.
[26] Miao Huang et al., "Effects of Ambient Air Pollution on Blood Pressure Among Children and Adolescents: A Systematic Review and Meta-Analysis," Journal of the American Heart Association 10, no. 10 (2021): e017734, https://doi.org/10.1161/JAHA.120.017734; and W. R. Chan et al., "Estimated Effect of Ventilation and Filtration on Chronic Health Risks in US Offices, Schools, and Retail Stores," Indoor Air 26, no. 2 (2016): 331–43, https://doi.org/10.1111/ina.12189.
[27] "Morbidity and Mortality Weekly Report," US Centers for Disease Control and Prevention, May 2021, https://www.cdc.gov/mmwr/volumes/70/wr/mm7021e1.htm?s_cid=mm7021e1_w
[28] Piers MacNaughton et al., "Impact of Particulate Matter Exposure and Surrounding 'Greenness' on Chronic Absenteeism in Massachusetts Public Schools," International Journal of Environmental Research and Public Health 14, no. 2 (2017): E207, https://doi.org/10.3390/ijerph14020207; and Elinor Simons et al., "The Impact of School Building Conditions on Student Absenteeism in Upstate New York," American Journal of Public Health 100, no. 9 (2010): 1679–86, https://doi.org/10.2105/AJPH.2009.165324.
[29] Hatice S. Zahran et al., "Vital Signs: Asthma in Children — United States, 2001–2016," Morbidity and Mortality Weekly Report 67, no. 5 (2018): 149–55, https://doi.org/10.15585/mmwr.mm6705e1.
[30] Victoria Shier et al., "Ambient Air Pollution and Children's Cognitive Outcomes," Population and Environment 40, no. 3 (2019): 347–67, https://doi.org/10.1007/s11111-019-0313-2; Zs. Bakó-Biró et al., "Ventilation Rates in Schools and Pupils' Performance," Building and Environment 48 (2012): 215–23, https://doi.org/10.1016/j.buildenv.2011.08.018; S. Petersen et al., "The Effect of Increased Classroom Ventilation Rate Indicated by Reduced CO2 Concentration on the Performance of Schoolwork by Children," Indoor Air 26, no. 3 (2016): 366–79, https://doi.org/10.1111/ina.12210; Pawel Wargocki et al., "The Relationships between Classroom Air Quality and Children's Performance in School," Building and Environment 173 (2020): 106749, https://doi.org/10.1016/j.buildenv.2020.106749; and M. J. Mendell et al., "Association of Classroom Ventilation with Reduced Illness Absence: A Prospective Study in California Elementary Schools," Indoor Air 23, no. 6 (2013): 515–28, https://doi.org/10.1111/ina.12042.

occupants.[31] Better indoor air quality can benefit cognitive function and improve workforce performance by 10%, as well as limit absenteeism.[32] Indoor air quality protections save employers money in avoided productivity and sick day losses, while also improving worker satisfaction.[33]

4. **Including the monitoring and standardization of nitrogen oxides (NO_x) will reflect the best available science and strengthen the proposed bills by maximizing air pollution reduction and human health benefits.**

The committee should include the monitoring and standardization of ozone- and particulate-forming nitrogen oxides (NO_x), a group of toxic gases including nitrogen dioxide (NO_2) and nitric oxide (NO) commonly associated with combustion, in addition to the currently proposed pollutant list in all the bills. Doing so will be key to providing comprehensive public health and quality of life benefits to New Yorkers given the role of NO_x in the formation of other health harming pollutants such as ozone (O_3) and $PM_{2.5}$ as well as the association between exposure to NO_2 and a range of adverse health impacts.[34]

Indoors, NO_2 continues to be a key criteria pollutant of concern, with exposure to even low levels (well below the U.S. EPA outdoor standard) having been associated with a range of respiratory conditions.[35] Gas cooking appliances are primary NO_2 sources indoors. The EPA states that homes with gas stoves can have concentration of NO_2 – a pollutant associated with impacts to respiratory health – that are 50-400% greater than homes with electric stoves.[36] One reason for continuing concern is the large number of people exposed to this type of pollution in New York City. Census data reveals that almost 80% of New York City households still use gas stoves (piped or bottled).[37] An air quality measurement pilot from earlier this year registered a significant drop in NO_2 levels (35% reduction) after switching out an old gas stove for a new

---

[31] Maria Doulis, "The Growth of NYC Employee Headcount," CBC NY, May 18, 2020, https://cbcny.org/research/growth-nyc-employee-headcount

[32] Jose Guillermo Cedeño Laurent et al., "Associations between acute exposures to PM2.5 and carbon dioxide indoors and cognitive function in office workers: a multicountry longitudinal prospective observational study," Environmental Research Letters, September 9 2021, https://iopscience.iop.org/article/10.1088/1748-9326/ac1bd8; and D P Wyon, "The Effects of Indoor Air Quality on Performance and Productivity," Indoor Air, 2004, https://doi.org/10.1111/j.1600-0668.2004.00278.x.; Juan Palacios et al., "Moving to Productivity: The Benefits of Healthy Buildings," PLoS One, 2020, https://doi.org/10.1371%2Fjournal.pone.0236029

[33] Juan Palacios et al., "Moving to Productivity: The Benefits of Healthy Buildings," PLoS One, 2020, https://doi.org/10.1371%2Fjournal.pone.0236029

[34] United States Environmental Protection Agency (EPA), "Integrated Science Assessment (ISA) for Oxides of Nitrogen - Health Criteria," U.S. EPA, January 2016, https://www.epa.gov/isa/integrated-science-assessment-isa-oxides-nitrogen-health-criteria.

[35] United States Environmental Protection Agency (EPA), "Integrated Science Assessment (ISA) for Oxides of Nitrogen - Health Criteria," U.S. EPA, January 2016, https://www.epa.gov/isa/integrated-science-assessment-isa-oxides-nitrogen-health-criteria.; Kathleen Belanger et al., "Household Levels of Nitrogen Dioxide and Pediatric Asthma Severity," *Epidemiology* 24, no. 2 (March 2013): 320–30, https://doi.org/10.1097/ede.0b013e318280e2ac.

[36] "Health and Air Quality Impacts of Cooking with Gas," RMI, https://rmi.org/press-release/health-air-quality-impacts-of-cooking-with-gas/

[37] United States Census Bureau, "2021 New York City — Heating, Air Conditioning, and Appliances — All Occupied Units," American Housing Survey Table Creator, 2021, https://www.census.gov/programs-surveys/ahs/data/interactive/ahstablecreator.html?s_areas=35620&s_year=2021&s_tablename=TABLE3&s_bygroup1=1&s_bygroup2=1&s_filtergroup1=1&s_filtergroup2=1.

induction stove in New York City public housing apartments.[38] Further, research has found that typical ventilation measures such as opening windows or running mechanical ventilation inadequate to reducing NO_2 levels in the home.[39]

Although exposure to NO_2 pollution is harmful to everyone, children are particularly at risk. Infants and children are more susceptible to illnesses associated with air pollution than adults due to several factors: they breathe faster, tend to engage in more physical activity, have a higher ratio of lung surface to body weight, and have less mature respiratory and immune systems.[40] Studies have shown that asthmatic children exposed to NO_2 indoors, at levels well below the U.S. EPA outdoor standard, are significantly at risk for increased asthma morbidity.[41] Additionally, these risks have been demonstrated to occur at NO_2 concentrations common in urban and multifamily homes. In addition, a number of epidemiological studies have demonstrated associations between NO_2 exposure and premature death, cardiopulmonary effects, decreased lung function growth in children, respiratory symptoms, emergency room visits for asthma, and intensified allergic responses.[42] As exposure to NO_2 continues to be a public health concern, especially regarding the respiratory health of children with asthma, monitoring and regulating indoor concentrations of NO_2 will yield valuable benefits to many residents.

Additionally, it has been found that air pollution plays a significant role in increasing our susceptibility to severe COVID-19 outcomes, including death. Researchers from Emory University found that even exposure to very low concentrations of NO_2 greatly increased the susceptibility to death from COVID-19, suggesting that efforts to lower air pollution may greatly reduce population-level risk of severe COVID (and other infectious diseases) outcomes.[43]

Conclusion

We are deeply encouraged by the timely proposal to monitor and standardize indoor air quality in New York City at a time where residents continue to suffer the devastating consequences of air pollution. Broadly, indoor air pollution is an overlooked health issue in the U.S. Little guidance is available to understand health risks indoors, and even less policy exists to regulate harmful

---

[38] WE ACT for Environmental Justice , "Out of Gas, in with Justice Studying the Impacts of Induction Stoves on Indoor Air Quality in Affordable Housing," January 31, 2023, https://www.weact.org/wp-content/uploads/2023/02/Out-of-Gas-Report-FINAL.pdf.

[39] Christopher Bland et al., "Studying the Optimal Ventilation for Environmental Indoor Air Quality Studying the Optimal Ventilation for Environmental Indoor Air Quality Prepared for the JPB Foundation and Enterprise Community Partners," *National Center for Healthy Housing* , April 13, 2022, https://nchh.org/resource-library/report_studying-the-optimal-ventilation-for-environmental-indoor-air-quality.pdf.

[40] *Clean the Air for Children: The Impact of Air Pollution on Children,* United Nations Children's Fund (UNICEF), Octover 2016, https://www.unicef.org/media/49966/file/UNICEF_Clear_the_Air_for_Children_30_Oct_2016.pdf

[41] Kathleen Belanger et al., "Household Levels of Nitrogen Dioxide and Pediatric Asthma Severity," *Epidemiology* 24, no. 2 (March 2013): 320–30, https://doi.org/10.1097/ede.0b013e318280e2ac; Kathleen Belanger et al., "Association of Indoor Nitrogen Dioxide Exposure with Respiratory Symptoms in Children with Asthma," *American Journal of Respiratory and Critical Care Medicine* 173, no. 3 (February 2006): 297–303, https://doi.org/10.1164/rccm.200408-1123oc.

[42] United States Environmental Protection Agency (EPA), "Integrated Science Assessment (ISA) for Oxides of Nitrogen - Health Criteria," U.S. EPA, January 2016, https://www.epa.gov/isa/integrated-science-assessment-isa-oxides-nitrogen-health-criteria.

[43] Donghai Liang et al., "Urban Air Pollution May Enhance COVID-19 Case-Fatality and Mortality Rates in the United States," *The Innovation*, September 2020, https://www.cell.com/the-innovation/fulltext/S2666-6758(20)30050-3#%20

indoor air pollutants. We believe that these bills will provide real-time data on pollutants and give us the scientific basis to formulate and implement target measures to reduce emissions from top sources. However, we urge the committee to clarify how health and quality of life benefits can be meaningfully maximized for New Yorkers by detailing how NO_x will be monitored and standardized accordingly in each of these four bills. Doing so in addition to passing these bills will allow New York City to set a leading example for cities across the country who are seeking to best protect their residents. We stand ready to support the city in achieving these goals and thank you for your consideration and extensive investment in these issues.

Sincerely,

Leah Louis-Prescott
Manager, Carbon-Free Buildings

Mike Henchen
Principal, Carbon-Free Buildings

Nina Prescott
Associate, Carbon-Free Buildings

Yu Ann Tan
Senior Associate, Carbon-Free Buildings

September 29, 2023

To Whom It May Concern,

My name is Anna Popinchalk and I am a parent in Brooklyn. My daughter will start attending New York Public Schools in the coming years, and we know many current students in Windsor Terrace and Park Slope. I am writing today during torrential rain which is causing unprecedented flooding – undoubtedly the beginning of our new reality due to climate change. This, among many reasons, is why I support INT 1127 in monitoring air quality in schools.

As the climate crisis worsens, smoke from wildfires will become a more frequent occurrence, something that our schools are not prepared for. When the wildfire smoke hit dangerous levels this year, schools were ill equipped to manage the situation. They had no way of knowing whether the air inside their buildings was safe. Schools cannot tackle a problem they don't know exists - schools currently don't have the tools for monitoring AQ and no standards to compare it to. Studies have shown that transmission of respiratory diseases such as Covid can be reduced by improving indoor ventilation, yet there are currently no standards for ventilation in schools.

With this in mind, I urge the committee to pass the bill.

Thank you for your consideration.

Best,

Anna

To the New York City Council:

My name is Autumn Tarleton and I am a resident of Brooklyn. My family (myself, my partner, and our seven year old daughter) lives near the Navy Yard. I am a member and activist with NY Renews and Climate Families NYC.

I am writing this testimonial to show support of the following bills about monitoring Air Quality in New York City buildings: Int 1127-2023, Int 1128-2023, Int 1129-2023, and Int 1130-2023. Since the Covid-19 pandemic began in 2020, I have learned more about Air Quality than I ever imagined I would–and I have been monitoring Air Quality everywhere I go ever since. As we have learned, Covid-19 is airborne and can be reduced in the air through air purification and proper ventilation. I started a donation campaign at my child's sliding scale private school to raise money for air purifiers for each and every classroom. I personally opened windows in the school every day and positioned outward facing fans to assist with ventilation. Studies have shown that transmission of airborne respiratory diseases such as Covid can be reduced by improving indoor ventilation, yet there are currently no standards for ventilation in schools. For the two years my daughter attended school after the pandemic started, there was zero Covid spread happening in her school's classrooms and that is largely in part due to the amount of fresh air provided to those students. Along the way, I learned of the ramifications of mold in our city buildings and schools and how air purification decreases the amount of spores inhaled. The same can be said for general allergens like pollen and dust. Studies have shown that better ventilation in classrooms is linked to improved academic achievement: https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1600-0668.2010.00686.x Asthma (which 60,000 NYC students have) can also be exacerbated by indoor pollutants and is a leading cause of absenteeism. All children should have a right to a safe, clean environment in school.

And then came June 7th, 2023, when we saw our city skies darken in hazardous orange smoke and our air quality index shattered records with a whopping 405 out of 500. All of us–students in school buildings, babies and elders in residential buildings, and laborers in commercial buildings–moved inside to avoid the wildfire smoke. What we had learned–but rather unfortunately largely stopped instituting–about Covid and air quality came back to us in the form of climate change impact. As the climate crisis worsens, smoke from wildfires will become a more frequent occurrence, something that our city buildings are not prepared for–yet. This is also an environmental justice issue. High poverty neighborhoods have a higher risk of pollution related health issues, putting them at higher risk for complications from Covid and other respiratory diseases, as well as the ramifications of the climate catastrophe. Due to unprecedented Canadian wildfire seasons, we will continue to be affected by the health impacts of wildfire smoke. Due to record disastrous flooding events in New York City, increased mold in our apartments and offices will affect our long term lung health. Climate change is here. Monitoring will show the disparities in air quality in our city and give us the data we need to advocate for better air quality in schools, homes, and workplaces. We need these tools today.

Thank you,
Autumn Tarleton/September 26, 2023

Barbara J. Kelly MSW
Beach 120th Street
Rockaway Park, NY 11694
barbarajkelly1@gmail.com

Thank you for your consideration of this testimony regarding Int 1119-2023, a Local Law to amend the administrative code of the City of New York in relation to an annual report on drowning deaths.

As a nearly lifelong resident of the Rockaways, water safety is a critical issue that all our residents know well. Inevitably, every summer we hear helicopters circling overhead, a signal of yet another potential tragedy on our peninsula.

It's important that we successfully collect and analyze data to help understand what factors influence drowning risk: age? time of day? location: beach vs pool? lifeguard presence? substance use?

An annual report on drowning deaths would help communities and policymakers to better understand the risk factors for drowning so our city and communities take action to save lives due to drowning.

As the entire city faces the challenges of climate change including storms like Hurricanes Sandy and Ida, more New Yorkers are exposed to the dangers of drowning caused by flooding, and heatwaves that drive more people to seek relief from the heat in the water.

Thank you for your consideration.

Sincerely,

Barbara J. Kelly MSW

I am writing to express concern about the water safety issue in the Rockaways, including:

- This testimony regards Int 1119-2023, a Local Law to amend the administrative code of the city of New York, in relation to an annual report on drowning deaths.
- Water safety is a critical issue that Rockaway knows well - every summer we hear helicopters circling overhead, a signal of yet another potential tragedy on our peninsula.
- We need data to help understand what factors influence drowning risk: age? time of day? location: beach vs pool? lifeguard presence? substance use?
- An annual report on drowning deaths would help communities and policymakers to better understand the risk factors for drowning so our city and communities take action to save lives due to drowning.
- These efforts will be particularly critical as the city faces the challenges of climate change: storms like Hurricanes Sandy and Ida caused New Yorkers to drown due to flooding, and heatwaves cause more people to seek relief from the heat in the water.
- Thank you for your consideration of this matter.
- The lifeguard shortage led to increased danger. We were lucky that the shark attack happened before 6 pm on a beach that had a lifeguard - the woman lost her leg, but would have died otherwise. Shark issues have also raised concern and the need for water safety training and lifeguards
- Kids drinking in the thousands on evenings, days, weekends: July 4, the beach was elbow to elbow in Belle Harbor, police were called, and they peeked at the drunk crowds of kids, underrage drinkers, and did nothing, they left. There are unmanaged fires, and drunks going into the ocean, which is unsafe.

Thank you for your attention

C Johnson

Belle Harbor resident

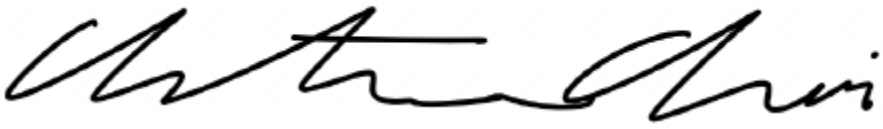
My name is Christina Choi, and I am a parent of a 7-year-old in Brooklyn. I'm writing to advocate for the passing of the bill named "Standards and reporting regarding indoor air quality in schools within the city school district."

As we are living through the climate crisis right now, we will only see more extreme weather patterns, including those that impact everyday air quality. The wildfire smoke from Canada that blanketed the air in New York City for days this summer is only going to become more frequent and extreme. The very first day of the wildfire smoke this summer (when the city did nothing to alert its residents), I went out and walked around without a mask—only to get sick that very night, which lasted a few days. I was coughing and had an extremely painful headache.

My child was thankfully not outdoors for long that day, as we immediately limited her time outdoors as soon as we learned this was wildfire smoke and not fog. And yet, she still was experiencing a runny nose and coughs. The science shows that even low levels of PM2.5 (fine particulate matter) are harmful for those at high risk, including children. The World Health Organization recently revised its air quality guidelines to 5 micrograms per cubic meter—a big difference from the EPA's current national standards of 12 micrograms per cubic meter.

The long-term impacts of high PM2.5 on children are serious. Small particles can enter the bloodstream through the lungs—soot pollution has been tied to all sorts of health issues, such as cardiovascular diseases, cancer, and tissue damage. While the kids may seem fine in the short term, the long-term impacts cannot be ignored.

Not only should we be revisiting the standards and reporting of indoor air quality in schools, but we should also be clear to private schools and other youth institutions (soccer leagues, for example) that they should not be allowing their children to play outdoors when the air quality levels rise to a certain point. As a parent, I implore you to pass this bill and do even more to protect our children from yet another devastating consequence of climate change. Thank you for the opportunity to submit my testimony.



Christina Choi
9/27/23

29 September 2023

New York City Council

City Hall

New York, NY 10007

Subject: Urgent Need for Monitoring Indoor Air Quality in Public Spaces

Dear Members of the New York City Council,

I am writing to express my deep concern and disappointment regarding the apparent lack of interest in monitoring indoor air quality, as highlighted by Council Member Powers during the recent public health hearing on [Date of the meeting, e.g., "Wednesday, September 27, 2023"].

The quality of the air we breathe indoors is of paramount importance, especially in a densely populated city like New York. Monitoring parameters such as CO2 and PM2.5 are not just numbers; they provide crucial insights into the safety and health implications of staying in a particular indoor environment. For instance, understanding whether the CO2 concentration in a room is at 4,000 ppm or below 1,000 ppm can significantly influence our decision to remain in that space. High CO2 levels can indicate poor ventilation, which can increase the risk of airborne transmission of respiratory infections.

Prominent researchers have emphasized the importance of monitoring indoor air quality. Professor Donald K. Milton, a renowned expert in the field, has extensively studied the role of CO2 sensors in understanding ventilation and its implications for public health. Similarly, Professor Jose Luis Jimenez at the University of Colorado Boulder and Professor Shelly Miller have conducted significant research underscoring the importance of understanding and improving indoor air quality. Please see this link:

https://eos.org/features/indoor-air-pollution-in-the-time-of-coronavirus

Ignoring the need for such monitoring is not just a missed opportunity; it's a neglect of our responsibility to ensure the health and safety of New York City's residents and visitors. As we continue to navigate the challenges of the COVID-19 pandemic and other potential public health threats, it is imperative that we utilize every tool at our disposal to safeguard our communities.

I urge the City Council to prioritize the monitoring of indoor air quality in public spaces. Investing in this initiative is not just a matter of public health; it's a testament to our commitment to the well-being of every individual who calls New York City home.

Thank you for your attention to this critical matter. I hope that the Council will take swift and decisive action to address these concerns.

Sincerely,

David Eldredge

Owner of NALTIC Industrials

888-891-0077

I am contacting to express my support of INT 1127-2023, 1128-2023, 1129-2023, and 1130-2023. These are vital public measures and can greatly help NYC by improving indoor air quality. We cannot have any repeats of New Yorkers being exposed to toxic air such as the unsafe air after 9/11 especially at schools. New Yorkers deserve clean air and this bills introduced by Keith Powers make it possible.

Devin Kreitman

I’m a public school parent in Queens and I am writing in support of 1127. There are so many reasons this bill could help our children. They should be better protected from air pollution, smoke from forest fires and diseases like COVID-19. I urge the committee and the council to pass this bill and to include provisions that would make meeting the AQ standards in schools mandatory.

Elizabeth L Gonzalez
61st Avenue
Little Neck NY 11362

I'm a parent of two kids and I am testifying in support of Intro 1127. Thank you for bringing this bill.

Right now there is an invisible threat in our city's schools. And it's in the air.
The ongoing Covid19 pandemic and the wildfire smoke that hit the city this year have exposed the problem, but it has always been there. It's time to sit up and pay attention.

Speaking of paying attention, we tell our kids to do it. We tell them: Go to school, pay attention. Learn. *Behave*. Then we put them in a closed room with 20 other people and little ventilation. In rooms like this Carbon Dioxide levels build and at levels of CO2 over 1400ppm the human brain suffers a 50% decline in cognitive ability. Any classroom without central air and no window open is probably reaching this 1400ppm level on a daily basis.

I have monitors for my home. I disagree with the Dept of Health's comments that this data is not useful. I don't have central air so I absolutely use data from our monitors to take steps to improve our home's AQ (open a window/close a window/turn up a filter/..). Schools don't have these tools. They have no idea how safe or, more likely, unsafe the air within their walls is.

I have two young children with developing lungs and brains. We had a year in public school then we decided to homeschool. We never planned to homeschool. We're doing it because the air inside most schools is just plain unsafe. Parents like me know this because we have been measuring it with our own portable devices such as particle counters and CO2 monitors.The principal and staff in our school had very little interest or knowledge in the importance of ventilation in classrooms, nor did they feel like they had a mandate to do anything about it.

It became clear to us that attendance was more important to our department of Education than kids' health - they have taken the view that everyone should be in school at all costs whether the air is safe or not. That's shortsighted because one of the leading causes of absenteeism is asthma, a condition from which 5% of the student body suffer. School should be a haven of clean air for them, not making them sicker.

Another cause of absenteeism? Illness. Studies have shown that increasing air changes per hour and installing HEPA filters can vastly reduce viral transmission in indoor settings. Instead we are cramming our children together, exposing them repeatedly to viruses like Covid19, and then wondering why absenteeism rates are rocketing. .

If I knew the air at my kids' school was clean and healthy, I would absolutely send my kids to school. Give us this data. Pass Intro 1127 so we can see for ourselves what the air quality is like in our schools. Give us this data, set good AQ standards, and educate our school communities so we can advocate for our kids. Even better, make safe, clean air mandatory in our schools. Give schools the funding and the tools they need to make their air safe for all our children and teachers. Monitoring is a good first step that we desperately need but we also urgently need remediation and filtered central air in every school.

Ella Ryan
Brooklyn, NY

Dear Committee,

My name is Esther Crow and I am a parent of a 10-year-old who attends Special Music School (M859) on West 67th Street and a member of Climate Families NYC. I support Int 1127 and monitoring air quality in schools. Every child should have the right to clean air in schools, especially since children spend most of their day at school. Studies have shown that transmission of respiratory diseases such as Covid can be reduced by improving indoor ventilation, yet there are currently no standards for ventilation in schools. Please pass this bill and include provisions that would make meeting the AQ standards in schools mandatory. Children who have been exposed to high levels of air pollution may also be at greater risk for chronic diseases such as cardiovascular disease later in life. This is also a racial justice issue as children of color disproportionately suffer from asthma and other respiratory issues. Furthermore, researchers have noticed a decline in concentration, vigilance, and memory in children exposed to high CO2 levels in schools.

I am fully in support of implementing 1127 ASAP and providing adequate ventilation in all of our NY Schools!

Thank you for all of your hard work on this,

Esther Crow

Oversight Hearing, Protecting New Yorkers from Heat and Air Quality Emergencies

Experts from the Johns Hopkins Center for Health Security have made an urgent call for state lawmakers to enact legislation to improve indoor air quality in public spaces based on the Model State Indoor Air Quality Act.

Indoor air quality can be polluted by mold, radon, carbon dioxide, particulate matter, chemicals in cleaning products, off-gassing from building materials and furnishings, among other things. The level of pollutants indoors can be two to five times higher than measured outdoors.

Despite this, New York City has no data on the level of contaminants in our buildings. We can and must do better.

As a longtime New York City resident of more than 20 years I strongly support these bills and call on the City Council and the Mayor to urgently act to go even further to expand ventilation in our buildings and clean our air.

Submitted by: Jacqueline Esposito, Esq.

To the members of the city council:

I write today to encourage you to set high standards for air quality in schools and other buildings, and to monitor air quality to ensure that those high standards are reached. Current events show that air quality is a significant issue. This summer's wildfire smoke offered one vivid example. Many illnesses are spread through the air, including COVID-19 and others. Clean air is good for people who experience allergies and asthma. Furthermore, studies show that high levels of carbon dioxide, in spaces where people are re-breathing the same air, cause people to feel tired and have trouble concentrating. Just as we need clean water to stay safe and healthy, we also need clean air. Healthy kids are able to learn more effectively in school, and healthy adults are better able to contribute to the economy. All of us deserve to enjoy our lives free from pollution and disease. I ask you to enact measures to keep indoor air safe. Thank you for your consideration.

Sincerely,
Jaime Cleland
Brooklyn

Greetings members of the city council,

I would like to show my support for Int 1119-2023. I'm a Rockaway resident and water safety is a major concern for us. I come from a long line of residents who swim. Growing up we didn't have access to pools, we cooled down in the summer by heading to the beach for a swim (our parents also didn't know how to swim). I can recall one summer where a friend and I got caught in a ripe-tide and were struggling and taking in water, we've must've been maybe ages 9-10. Our parents didn't notice nor did the lifeguards two older guys who we're not to far from us noticed and grabbed us and saved us. We didn't tell our parents what occurred because we were afraid of the consequences. Since that day I've become fearful of going into the ocean because I am not equipped to do so. Every year once it's warm enough to go into the water you start to hear the helicopters and hear the stories of someone sadly passing from drowning in our beaches. It's people of all ages, at all times of the day whether the beach is closed or open, whether swimming is permitted or not, it happens. Rockaway Beach is known for its dangerous beaches. We need more public pools in Rockaway, and easily accessible and affordable swim lessons. As a parent myself I used to have to travel off the peninsula to take my child to swim lessons because the YMCA in Arverne is too expensive (they are a non-for-profit how do they get away with charging what they charge). We can't prevent many tragedies in this world, but this is one that I believe can be prevented with the right resources.

Respectfully,
Jasmin Marin

This testimony regards Int 1119-2023, a Local Law to amend the administrative code of the city of New York, in relation to an annual report on drowning deaths. Every summer, residents of Rockaway sigh as they hear helicopters circling overhead, a signal that there may be yet another drowning off our peninsula. As a coastal city, NYC must do more to reduce the risks of drowning, such as by making sure that all residents know how to swim. An important step would be to understand who is at highest risk for drowning and what factors influence drowning risk (age? time of day? ocean vs pool swimming? lifeguard presence? substance use?). An annual report on drowning deaths would help communities and policymakers to better understand the risk factors for drowning, much like the city's annual Heat-Related Mortality Report produced by DOHMH helps understand factors related to deaths related to temperature extremes. With this understanding, our city and communities can then take action to save precious lives that are needlessly and tragically lost each year due to drowning. These efforts will be particularly critical as the city faces the challenges of climate change, especially after storms like Hurricanes Sandy and Ida that caused New Yorkers to drown, sometimes in their own homes due to flooding, and as soaring temperatures cause more people to seek relief from the heat in the water. Water safety is a critical issue. Thank you for your consideration of this matter.

Jenna Tipaldo

My name is Jessica Luck and I am the parent of a first grader at PS 151 in Manhattan and a member of Climate Families NYC. I am writing in support of Int 1127 and monitoring of air quality in schools. I also urge the council to strengthen the bill by making meeting air quality standards mandatory for schools and providing the necessary funding for schools to do so.

Improving air quality in schools would not only protect children from pollution and the devastating effects of the climate crisis on air quality, but would also protect students from respiratory ailments such as COVID-19.

Investing in clean air for our children will have long term positive effects not only on their health but also on their academic success, as studies show that poor ventilation in classrooms causes attention issues and decreased performance on standardized tests.
https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1600-0668.2010.00686.x

Poor air quality disproportionately affects children in high poverty neighborhoods and children of color who are already more likely to have asthma due to environmental racism.

Clean air is a right that all children deserve. Please pass the strongest version of this bill and give schools the budget and tools to enforce excellent air quality in all schools.

Sincerely,
Jessica Luck

I work in New York and I want better indoor air quality. I support INT 1127, 28, 29, and 30 and you should too.

New York must be a leading example in indoor air quality. Ventilation, HEPA filters, Upper Room UV Lights, air scrubbers, frequent air changes, and more will reduce pollution,and needless CO2, and limit the spread of all airborne illnesses. That includes Covid, RSV, TB, chickenpox, flu, and more. Better indoor air quality also increases alertness, which in term helps students in school, and staff at the workplace. We also need improved air quality monitors in every public space so the public is aware of the shared air.

The investment is going to help businesses as well. I would personally go out of my way to support a business with good indoor air quality.

Furthermore, in San Francisco, BART trains have installed denser MERV-14 filters and increased air changes to every 70 seconds. It's time New York does the same and modernize HVAC systems on public transit, schools, commercial, residential, and public buildings. I shouldn't have to put my health at risk because I have to go to a public space.

The benefits of clean indoor air are tremendous and will make New York a healthier place.

JoAnna Marks

This testimony regards Int 1119-2023, a Local Law to amend the administrative code of the city of New York, in relation to an annual report on drowning deaths.

- Water safety is a critical issue that Rockaway Beach knows well - every summer we hear helicopters circling overhead, a signal of yet another potential tragedy on our peninsula.
- We need data to help understand what factors influence drowning risk: age? time of day? location: beach vs pool? lifeguard presence? substance use? Experienced swimmers?
- An annual report on drowning deaths would help communities and policymakers to better understand the risk factors for drowning so our city and communities take action to save lives due to drowning.
- These efforts will be particularly critical as the city faces the challenges of climate change: storms like Hurricanes Sandy and Ida caused New Yorkers to drown due to flooding, and heatwaves cause more people to seek relief from the heat in the water.

Thank you very much for your consideration of this matter.

Jodi Heywood

Date: 9/27/2023

To: Committee on Health

Re: Int 1127-2023

As a parent of a NYC public school student in Council District 33, who has attended through the pandemic, this law is overdue. Our schools are crowded (*e.g.*, my son's 1st grade class has 34 students and one teacher) into old buildings with poor and haphazard ventilation. Particularly given the pollution in our neighborhoods and the proliferation of harmful airborne disease (e.g., RSV and COVID-19), the bare minimum we can do to protect children in NYC public schools is to set indoor air standards and monitor the air in our schools.

According to the American Lung Association, children are particularly vulnerable to airborne disease:

> The lungs and their alveoli aren't fully grown until children become adults. In addition, the body's defenses that help adults fight off infections are still developing in young bodies. Children have more respiratory infections than adults, which also seems to increase their susceptibility to air pollution.

See https://www.lung.org/clean-air/outdoors/who-is-at-risk/children-and-air-pollution.

Any cost to implement and ensure compliance with Int 1127-2023, pales in comparison to the cost to our children and public health writ large if the law is not enacted.

Therefore, I ask that the Committee pass Int 1127-2023. I also ask that the Committee not stop here, but embark on a thorough investigation and swift lawmaking process to ensure that all New Yorkers have clean air, water, homes, and public spaces safe from pollutants.

Thank you,

Joe Lawlor

My name is Joseph Castillo and I am the parent of a first grader at PS 151 in Manhattan and a member of Climate Families NYC. I am writing in support of Int 1127 and monitoring of air quality in schools. I also urge the council to strengthen the bill by making meeting air quality standards mandatory for schools and providing the necessary funding for schools to do so.

Improving air quality in schools would not only protect children from pollution and the devastating effects of the climate crisis on air quality, but would also protect students from respiratory ailments such as COVID-19.

Investing in clean air for our children will have long term positive effects not only on their health but also on their academic success, as studies show that poor ventilation in classrooms causes attention issues and decreased performance on standardized tests. https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1600-0668.2010.00686.x

Poor air quality disproportionately affects children in high poverty neighborhoods and children of color who are already more likely to have asthma due to environmental racism.

Clean air is a right that all children deserve. Please pass the strongest version of this bill and give schools the budget and tools to enforce excellent air quality in all schools.

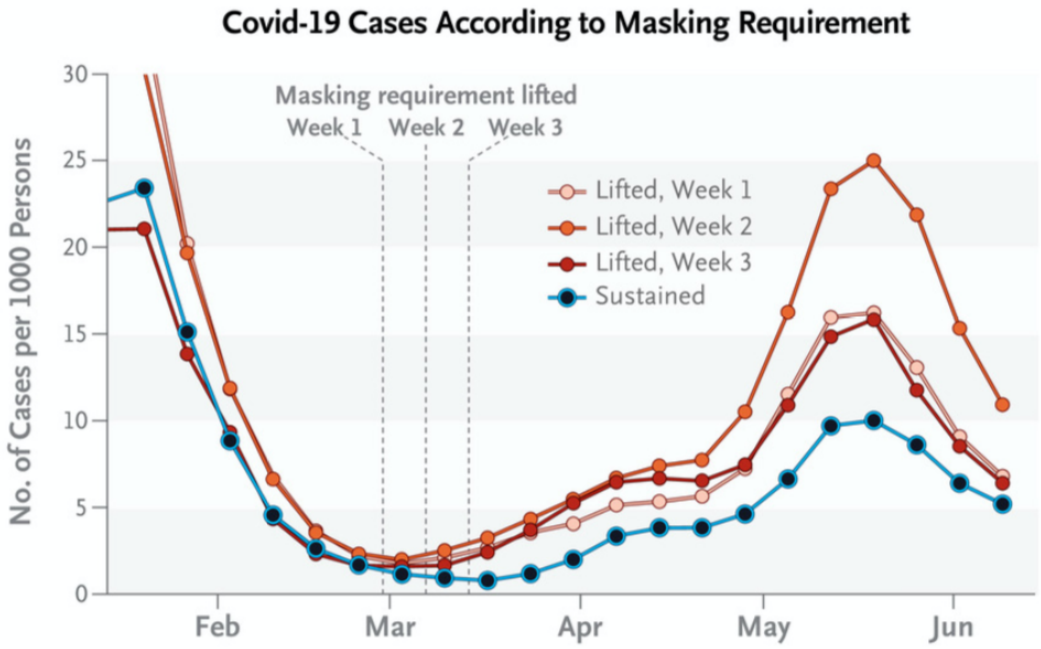
Sincerely,
Joseph Castillo

A universal mask mandate is the easiest, most cost-effective way to clean our indoor air. The purpose of masking is to keep the concentration of viral particles in the air LOW. For this reason, one way masking is not as effective as universal masking - if the filtration rate of a mask is, for example, 80%, that means that 20% of viral particles are not being filtered out. If the concentration of viral particles in the air is high, then they are still taking in 20% of a bigger number.

Mask mandates work, recommendations don't. A study published in the New England Journal of Medicine (PMID: 36351262) what happened in Massachusetts when schools diverged on whether they would follow state policy on masking or continue to mandate masks regardless of what the state did. The school districts that dropped their mask policy from mandates to recommendations had a higher incidence of Covid-19 than districts that kept masking requirements in place EVEN THOUGH in some cases, the former school districts were better resourced (ie. Had better ventilation). 100% compliance or enforcement is not the point - the messaging is the most important part of a mask mandate as it conveys the severity of the pandemic and the urgency for masking. At the very least, we should see the return of mask mandates in hospitals (people go to hospitals to receive care, not nosocomial infections), all public transportation and grocery stores.

In the meantime, yes, we should absolutely strive for better ventilation, and even Far-UVC light. Studies show that exposing a room to Far-UVC light reduces the concentration of aerosolized pathogens by 98.4% in 5 minutes, providing an additional 184 equivalent air changes per hour. This is over 10 times more effective than air purifiers. Because these lamps emit a small amount of ozone, which is harmful for respiratory health, it is imperative that they are used in spaces with functioning HVAC to maintain ozone concentrations below regulated values. All of this requires permanent infrastructure investments.

PMID: 36351262



Jossie J. Yashinskie

To the Committee on Health:

As the parent in New York City public school student, I am writing to urge you to pass Int 1127, which will set standards for and require reporting of indoor air quality in NYC public schools.

This fall, our children have returned to school amid a rise in COVID cases. More than three years into the pandemic, we know that improving ventilation and indoor air filtration is one of the most effective ways to prevent disease transmission and avoid the simultaneous surge in COVID, flu, RSV, and strep that we experienced last school year. Yet once again, New York City parents are left uncertain about the air quality in their children's schools.

Just last week, *Gothamist* reported that NYC schools were again buying filters for air purifiers whose effectiveness has been widely questioned and that, according to *Gothamist*, are now largely unused. Ventilation systems in NYC public schools vary widely. While some schools have modern HVAC systems, others must rely on air-conditioning window units and open windows. The dangerous outdoor air quality we experienced this summer because of smoke from Canadian wildfires makes this situation even more urgent. While open windows can help lower the risk of disease transmission, they put children at risk of health complications from poor outdoor air quality. Just yesterday, outdoor air quality in my area of Brooklyn was at a level unsafe for people who are sensitive to air pollution, which includes children with asthma. Because of the worsening effects of climate change, we can only expect this problem to continue, and the only way to protect our children is through proper ventilation and filtration to ensure that the air quality in their schools is safe.

Int 1127 would be an important first step in solving this problem. It would allow parents and school officials to know whether the ventilation and filtration in place in schools is adequate, and if it isn't adequate, it would mandate that schools make changes to ensure safe indoor air quality. When parents send their children to school, they deserve to know that their kids are in a safe environment. I have spent many hours sitting in the Emergency Department with a wheezing child, and last year my son missed over a week of school and again landed in the emergency room after eight days of fever due to a simultaneous case of the flu and RSV. While improving indoor air quality in schools will not eliminate these situations, it can significantly lower the risks of disease, breathing problems, and the resulting absences, which both children's learning and cause parents to miss work. It is essential for our children's safety and well-being that we take this common-sense step. I urge you to pass this bill.

Katherine Herman
Beverley Road, ###.
Brooklyn, NY

Lauren Phillips (Flatbush, Brooklyn)
Testimony, Int 1127
September 27, 2023

My name is Lauren Phillips and I'm a mom to a wonderful toddler who goes to daycare in Brooklyn. I'm writing in support of Int 1127 and for mandating that all schools, including daycares, pre-ks, and private schools, monitor air quality and meet high air quality standards.

During the wildfire emergency this summer, I (with the other parents at my daycare) scrambled to pool money to buy an air filter for our son's daycare. We were terrified that our baby was breathing such dangerous air, and we had no way to tell what the conditions were at his school. We already worried about the fact that his daycare is located on Church Avenue in Brooklyn- a trucking route where hundreds of trucks daily spew dangerous PM 2.5 pollution. The wildfires gave us even more reason to worry. My husband and I both have asthma and we don't want our son to suffer the same fate.

We know that indoor air quality is critical for health, especially for the littlest New Yorkers. In this stressful age of COVID, wildfire smoke, and ongoing air pollution from having too many cars and trucks on the road. Please not only pass the bill, but include provisions that would make meeting the air quality standards in the bill mandatory.

Michele Caracappa
Climate Families NYC

Written testimony

I am writing to urge you to pass legislation related to standards and reporting regarding indoor air quality in schools within the city school district. As the parent of a five year old who is enrolled in Kindergarten in District 5, I believe this law would greatly benefit my child, his classmates, and NYC students at large. The quality of students' physical learning environments — including air quality — directly links to their overall health, well-being, and success in school. In the wake of the pandemic and given increasing air quality concerns like what we experienced here in NYC last June, putting in place proactive measures to monitor and improve air quality is essential. I strongly urge the council to pass this amendment as it will greatly benefit NYC children and the educators who serve them.

Thank you for this chance to offer testimony in favor of Int. 1127 on indoor air quality standards and mitigation for public schools.

My name is Mimi Bluestone. I'm a retired NYC public high school teacher. Both of my children attended public city schools from pre-K through 12th grade. I'm also a leader of 350Brooklyn, an organization that works locally to counter the global climate crisis.

I urge the council to approve this bill. As a retired teacher, I did not have to teach through the horrible air quality crisis New York experienced this past June. I can only imagine how impossible it must have been simply to stay alert, let alone teach or learn then, especially given that many classrooms lack air conditioning and adequate ventilation.

Over the years I taught many students with asthma and other serious respiratory illnesses – 60,000 students in our schools suffer from asthma. Too many of my students missed class due to these medical conditions and could not complete the course work needed to progress through school and go on to graduation. Elevated levels of particulate pollution such as from busy roads or wildfire smoke pose a risk to all children but in particular to children with asthma.

As the climate crisis worsens, we can expect further serious air quality problems, something our schools aren't ready to face. Schools were caught off guard last June, especially as staff had no idea whether the air quality in their buildings was safe or how serious the problem was. There are no systems in place for monitoring air quality and no standards in place for comparison.

Studies show that improved ventilation can reduce the spread of disease such as Covid and that better ventilation is linked to stronger academic achievement (example). As a teacher, it doesn't surprise me

at all that researchers have observed diminished concentration, vigilance, and memory in children exposed to high CO2 levels in schools.

Yet we have no standards for ventilation in school buildings. Elevated levels of particulate pollution such as from busy roads or wildfire smoke pose a risk to all children but in particular to children with asthma. This is a health issue for all of our students, and it is especially an issue for high-poverty neighborhoods that endure higher rates of asthma and other pollution-caused diseases. Children who are exposed to high levels of air pollution may also be at greater risk for chronic illnesses such as cardiovascular disease later in life (source).

Monitoring will show the disparities in air quality between schools in our city. It will give us the data we need to advocate for better air quality in schools.

While monitoring and setting standards is an important step, we must also provide the schools with poor air quality the tools to remedy it. I urge you to pass Int. 1127 to protect the students, teachers, and staff of our city's schools.

Thank you,
Mimi Bluestone

I am writing in great support of INT 1127, 28, 29, and 30. I support these pilot programs. However, these do not go far enough or start sooner than they should.

Monitoring indoor air quality in public spaces, schools, restaurants, public transit, venues, and commercial spaces is so important. And it must be continual monitoring, not just a reading in the morning.

Pollution and all airborne illness get trapped in buildings with no ventilation or air filtration. New York could be healthier with steps such as far-UV, MERV 14 filters in HVAC with frequent air changes, air scrubbers, air purifiers, and more.

There are great technologies that measure air quality and CO2. Better air quality will prevent the spread of current airborne illnesses and all future ones too. The time to act is now. The public deserves a right to know that the air they're breathing is safe. Plus, better air quality increases worker and student alertness! The benefits are tremendous.

Denmark monitors indoor air quality to great success. Additionally, BART trains in San Francisco upgraded their air filters to MERV 14, which are more dense and catch more particles. They also increased air changes to every 70 seconds. New York public transit, buildings, schools, etc. need to do the same.

Mindy Theresa

Statement NANCY JULIUS

Our building ventilation has never been good. Particularly in the one bedrooms, air does not disperse well. However, when our new landlords, Brookfield, took over, the ventilation noticeably worsened. I began to notice dirt in the air to the point where my eyes would tear and I would cough. Brookfield stopped changing the air filters in the apartments, which added to the mess.

In May of 2022 I awoke to an onslaught of dust and debris in the apartment which was unbreathable, and lasted for days. I had to leave. My cat had bronchial scarring, on Xray.

Our building does not have booster fans. Our roof fans are notoriously poor. They break often. I can always tell when my roof fan isn't working, because I start to choke and smell debris. My apartment becomes an ashtray. Sure enough, every time this happens I go to my vent and test it and it is broken.

In August of 2022, I obtained a doctor's note asking the building to fix the ventilation system, stating that it was affecting my health.

I have called in 311 twice. The first time, the fan wasn't running, but then it was and the case was closed. The second time, the fan was working.

We need outside expert to test our roof fans, recommend upgrades, and monitor them.

NEW YORK STATE PUBLIC HEALTH ASSOCIATION

Envisioning Healthy People in Healthy Places

Mission: The mission of NYSPHA is to promote and protect the public's health through professional development, networking, advocacy, and education.

Vision: Strengthening public health and taking action to make New York the healthiest state.

Testimony Submitted on Behalf of the
Board of Directors and the Membership of the
New York State Public Health Association
(NYSPHA)

to
The New York City Council
Committee on Health
Hearing 9/27/2023

on

Proposed Indoor Air Quality Standards in Schools and Public Buildings in New York City

by
Namita Kulkarni
Kavitha Das, BDS, MPH, MS
Lucy Zheng, MD
Gus Birkhead, MD, MPH, Chair
Policy and Advocacy Committee
New York City Policy and Advocacy Subcommittee

Dear Chairperson Schulman and Council Member Powers,

Thank you for the opportunity to provide input on the proposed bills (#1127, #1128, #1129, #1130) that aim to improve and standardize indoor air quality in schools and municipal buildings and establish pilot programs to monitor indoor quality in residential and commercial buildings.

These comments on the proposed bills are submitted on behalf of the New York State Public Health Association, a statewide organization whose members come from all disciplines across the spectrum of public health professionals, organizations, academia, and students pursuing careers in public health. Our mission is to improve the public's health through advocacy, education, networking, and professional development.

New York City is grappling with poor indoor air quality in schools and public buildings. In June 2023, New York City had an unusual air pollution event with levels of fine particulates (PM2.5) of more than 22 times the threshold set by the World Health Organization for safe air quality.[1] This event underlined the growing concerns with both the indoor and outdoor air quality of New York City. Air pollution was exacerbated by wind currents on distant wildfires in addition to that generated within New York City. Its impact on school and public building indoor air quality remains a key problem.[1]

A primary and pressing concern regarding air quality has centered on its impact on the health and well-being of individuals of all ages residing in public buildings throughout New York City. According to EPA studies of human exposure to air pollutants, indoor levels of pollutants may be two to five times, and occasionally more than 100 times higher than outside levels, which is particularly worrisome given the majority of people spend around 90 percent of their time indoors.[4] Inadequate maintenance of buildings, improper ventilation, use of harmful construction materials, application of toxic paints on the walls, hazardous surroundings and neighborhoods releasing toxic gases causing air pollution, and use of harsh cleaning products all lead to poor indoor air quality in schools and public buildings.[2] Additionally, combustion products, particulate matter and carbon monoxide emitted in tobacco smoke and wildfire smoke, radon, volatile chemicals in water, mold, pesticides, lead, asbestos, chemical off-gassing from pressed wood products, ozone from air cleaners and other volatile organic compounds are known to further exacerbate indoor air quality.[3]

Developing systemic, social, and community-level changes and improvements can mitigate the impact of unhealthy indoor and outdoor air quality thus improving the health and well-being of people of all ages as well as alleviating health disparities among racially and socially marginalized communities.

Indoor air quality is critical for optimal health and well-being of individuals of all age groups. Indoor air pollution has been consistently ranked as one of the top five environmental risks to public health in the US by the EPA.

The air quality in schools impacts children and adolescent's respiratory health, mental health, and overall health status. In the setting of inadequately ventilated public buildings, aforementioned pollutants and those from wildfire smoke can trigger bronchitis, asthma

exacerbations, coughing, wheezing, flu, colds, severe allergies, and others. Research has established a robust connection between Indoor Air Quality (IAQ) and respiratory infections. Consequently, this leads to higher rates of hospitalizations in those with predisposed respiratory or immunocompromising health conditions.

Poor indoor air quality can also affect mental health, which leads to overall poor health status and contributes to long-term dissatisfaction, stress and anxiety, poor academic and work performance, and absenteeism.

In the case of children, these environmental factors can contribute to poor academic performance, leading to student discouragement, heightened stress and anxiety, increased dropout rates, and overall dissatisfaction among both students and school staff. Studies have provided evidence that schools without significant maintenance backlogs tend to have better average daily attendance (ADA), with 4 to 5 more students attending per 1,000 students, and lower annual dropout rates, with 10 to 13 fewer students dropping out per 1,000 students. [6]

In older adults, exposure to poor air quality, pollutants, and other airborne hazards can lead to the development or worsening of severe health conditions such as COPD, heart attacks, heart failure, stroke, and cancer.

Indoor air pollution can negatively impact the health and well-being of vulnerable and marginalized populations in New York City, necessitating protective measures focusing on regional standards and pilot programs. Notably, studies have shown that low-socioeconomic status households are more exposed to poor indoor air quality, due to a combination of factors including quality of housing conditions, indoor occupancy, and occupant behaviors.

Specifically, smoke-free housing policies were made mandatory by the New York City Housing Association (NYCHA) under the Housing and Urban Development rule for all public housing from July 30, 2018.[5] The increased use of vapes can also contribute to increasing indoor pollutants. However, uneven adoption of smoke-free housing policies is pervasive among housing communities where socially disadvantaged individuals reside. One example lies in the difference in accepted social norms regarding smoking and tobacco use.[6] Consequences of exposure to second-hand smoke include increased incidence of asthma exacerbations, heart attacks, viral and bacterial respiratory infections, sudden infant death syndrome, blood clots, strokes, and cancers among adult non-smokers.[5]

Implementing systemic changes can help reduce the adverse effects of poor indoor and outdoor air quality. This, in turn, can enhance the health and well-being of individuals in the community and contribute to reduction of health disparities among racially and socially marginalized neighborhoods.

The New York State Public Health Association strongly supports the 4 proposed bills for the following reasons:

Indoor Air Quality in Schools

The proposed standard for indoor air quality in schools outlined in bill #1127 will protect student health. This bill proposes several key measures to improve indoor air quality in schools, including efforts towards establishing air quality standards for schools, providing real-time air quality reports, delivering annual summary reports, maintaining monitoring devices, and promoting awareness and educational outreach.

Specifically, healthy indoor air is crucial for school buildings. Students spend about 1,000 hours per year in school. Their participation in school, environmental exposures, and social activities and connectivity greatly influence childhood health, academic performance, educational attainment, lifelong outcomes in health, life expectancy, and socioeconomic status.

Currently, there is limited indoor air quality data that can measure the impact of pollutants, identify sources, and drive interventions and resolutions. With data on indoor pollutants, New York City officials can better address sources, equipment fuel use, energy performance and efficiency, and socioeconomic differences in resource equity and health in the public-school setting.

Indoor Air Quality in City Buildings

The proposed standard for indoor air quality in city buildings outlined in bill #1130 will have widespread benefits, for over 300,000 city employees in addition to visiting building occupants and employers. This mandates the establishment of indoor air quality standards for city buildings and conducts outreach and educational efforts related to this subject. It additionally supports real-time and annual reports on indoor air quality in city buildings that will be accessible to the public. These provisions encompass aspects that are essential for creating a healthier indoor environment in these structures.

By setting a baseline for acceptable air quality in city buildings and workspaces, these standards ensure that occupants are safe and free from harmful pollutants that can impact overall health and well-being. Poor indoor air quality has been shown to impact cognitive function, work performance, and absenteeism. Adverse effects of poor air quality, in the setting of reduced work productivity and efficiency, prolonged durations of missing work, and decreased cognitive abilities, can prove to be costly for both employers and employees.

Furthermore, by emphasizing the importance of outreach and education, it raises awareness among building occupants, employees, and employers about the significance of indoor air quality. This can promote best practices and actions for individuals in their immediate environments. Compounding with the bill's promotion of transparency with real-time reports, this empowers the public to stay informed about air quality in spaces they visit and work in, which can in turn foster accountability and encourage building owners and managers to prioritize best practices in maintaining good air quality.

Indoor Air Quality Data in Residential and Commercial Buildings

By collecting sufficient data on indoor air pollutants and setting standards in some spaces, the pilot programs proposed in bills #1128 and #1129 will help identify and address health and safety risks by creating a 5-year pilot program that will promote the installation of real-time air quality monitors in commercial buildings. New York City's building stock is varied in

age, proximity to outdoor pollutant sources, fuel use, and energy performance, among other factors that may influence indoor air quality. These pilot programs will help clarify which of these factors influence indoor air quality. Additionally, these pilot programs will provide desired data access to New Yorkers that can drive goal-oriented interventions.

In the wake of COVID-19, people are more concerned about indoor air; a recent US survey showed 91% of consumers believe indoor air quality is critical to fight infectious disease, and 72% would benefit from available data on indoor air quality before entering a building. The presence of dampness and mold in the home increases the risk of asthma and other harmful respiratory health impacts by 30-50 percent.[6]

Including the monitoring and standardization of nitrogen oxides (NO_x) will strengthen the proposed bills by maximizing air pollution reduction and human health benefits. In addition to the proposed pollutant list in all the bills, NO_x, a group of toxic gases including nitrogen dioxide (NO_2) and nitric oxide (NO), should be included due to the association of NO_2 exposure with a range of adverse health impacts, and the role of NO x in the formation of other health-harming pollutants such as ozone (O_3) and fine particulate matter (PM 2.5). NO_2 is a key criteria pollutant of concern, as exposure at even low levels is associated with respiratory effects, with greater impacts for sensitive groups like children including increased risk of illness, asthma exacerbation and morbidity, lung and pulmonary function, and susceptibility to severe outcomes from diseases like COVID-19.

Indoor air quality standards are an important step towards cleaner, healthier air and communities. We are encouraged by the proposals to regulate indoor air quality in New York City to protect human health and are grateful for the opportunity to provide feedback.

Thank you,

Namita Kulkarni
Kavitha Das, BDS, MPH, MS
Lucy Zheng, MD
Gus Birkhead, MD, MPH, Chair
Policy and Advocacy Committee
New York City Policy and Advocacy Subcommittee

Address comments/questions to Advocacy@NYSPHA.org

References

1. Michael. Does New York City have the worst indoor air quality in the world? Accessed September 21, 2023. https://www.airthings.com/resources/new-york-indoor-air-quality
2. Association NE. Addressing Indoor Air Quality in Schools | NEA. Accessed September 22, 2023. https://www.nea.org/resource-library/addressing-indoor-air-quality-schools
3. US EPA O. Indoor Air Quality. Published November 2, 2017. Accessed September 21, 2023. https://www.epa.gov/report-environment/indoor-air-quality

4. US EPA O. Reference Guide for Indoor Air Quality in Schools. Published October 2, 2014. Accessed September 21, 2023. https://www.epa.gov/iaq-schools/reference-guide-indoor-air-quality-schools
5. Smoke-Free - NYCHA. Accessed September 22, 2023. https://www.nyc.gov/site/nycha/residents/smoke-free.page
6. US EPA O. How Does Indoor Air Quality Impact Student Health and Academic Performance? Published October 16, 2014. Accessed September 29, 2023. https://www.epa.gov/iaq-schools/how-does-indoor-air-quality-impact-student-health-and-academic-performance

Nicole Lopez-Jantzen, PhD

Written Testimony: Air quality as an equity issue

Dear Members of the Committee:

I am a professor at CUNY, where most of the students whom I teach come from households that make under $25,000 a year. In 2020, many of my students lost multiple family members. Now, many are still frontline workers, and/or live with children in the NYC School system. My students and their family deserve all mitigations against COVID to be taken – it is an equity issue. Most people do not know very much about ventilation and the importance of it to COVID mitigation, which is part of the problem. It is important that we provide the education and at the very least in places like public transportation, schools, and hospitals, make sure that we institute clean air initiatives.

I myself also have long COVID, and have a CO2 reader to try and understand the risk to myself. I am disabled and it is still difficult to plan, as I do not know if the places I need to go have proper ventilation to help reduce COVID risk, and often the health care offices that I have to go to for doctor's appointments have high CO2 levels and nobody masking. It is vital that in places where disabled people – who make up about 25% of the population – need to be have proper ventilation and in health care, where we can be exposed to sick people, masking is necessary. 19 million Americans, including many New Yorkers, have long COVID, including 1 million children. It is imperative that we have mitigations to try and reduce the number of new long COVID cases and protect people who are already vulnerable. It is an equity issue, as a disproportionate number of Latinx children have long COVID. Thank you.

Best,

Nicole Lopez-Jantzen

I work in new york and I want better indoor air quality. I support INT 1127, 28, 29, and 30 and you should too.

New York must be a leading example in indoor air quality. Ventilation, HEPA filters, Upper Room UV Lights, air scrubbers, frequent air changes, and more will reduce pollution, needless CO2, and limit the spread of all airborne illnesses. That incldues Covid, RSV, TB, chickenpox, flu, and more. Better indoor air quality also increases alertness, which in term helps students in school, and staff at the workplace. We also need improved air quality moniotors in every public space so the public is aware of the shared air.

Furthermore, in San Francisco, BART trains have installed denser MERV-14 filters and increased air changes to every 70 seconds. It's time New York does the same and modernize HVAC systems on public transit, schools, commercial, residential, and public buildings. I shouldn't have to put my health at risk because I have to go to a public space.

The benefits of clean indoor air are tremendous and will make New York a healthier place.

Paul Hennessy

My name is Pong and I was previously worked at higher education.

I'm writing to demand stronger indoor air quality efforts in NYC. I urge all members here to speak out & call for mask mandate to be reinstated in healthcare settings and public transit, and provide Free N95s to the general public. HEPA filters can be installed in so many building, education on how to use them and corsi rosenthal boxes. So much can be done.

We all have a responsibility to protect our immunocompromised, disabled, and other high risk people in New York. We shouldn't have to risk breathing in smoke, pollutants, or getting airborne viruses like Covid in indoor settings like public transportation and hospitals.

Masks are a critical tool to reduce both wildfire smoke and Covid transmission.
They are most effective when everyone wears one.

Just as free N95s were suddenly able to be collected and distributed in June 2023, we can continue doing those distributions. The federal government redistributed 4 free at home covid tests per household this week. They can do more. And all of you can do more to keep our communities safer.

Richard Oral Remarks

Committee on Health's Legislative Hearing, "Oversight - Protecting New Yorkers from Heat and Air Quality Emergencies"

September 27, 2023

1:00pm

Virtual

Distinguished members of this Committee, thank you for holding this hearing. I'm Richard Bruns, economist at the Johns Hopkins Center for Health security, and one of the authors of the ASHRAE 241 standard. The opinions expressed herein are my own and do not necessarily reflect the views of Johns Hopkins University or ASHRAE.

I specialize in cost-benefit analysis of public health policy. I'd like to make three main points. First, labeling saves lives, even if the labeling process is imprecise. Second, PM 2.5 is the most important thing to label. Third, the benefits of labeling PM 2.5 are much higher than the costs.

Imagine a world where there were no restaurant inspections and no restaurant safety scores. 110 years ago, we lived in that world, and thousands of people died each year from foodborne disease and poison. The first step to saving those lives was letting people know what was going into their stomach. We should do something similar, so people know what's going into their lungs, and their children's lungs.

The most harmful kind of air pollution is smog, technically fine particulate matter or PM 2.5. that is the most important thing to label and control.

We know that any kind of regulation can get expensive, and it would be wrong to require new action if we couldn't show that the benefits were higher than the costs. However, we have many good studies showing that the benefits of reducing smog exposure are much higher than the costs. If you enact these four pieces of proposed legislation, then in the future, there will be less death and lower medical costs.

These proposals will reduce childhood asthma, and its pain and medical costs. They will reduce heart attacks, strokes, and COPD. Individuals and governments will save money on health care, compared to a world where you don't control what's going into people's lungs.

Thank you again for the chance to testify today, and I encourage your questions on the costs and benefits of indoor air quality regulation.

More Details, with Citations

Each 1 µg/m^3 of chronic PM2.5 exposure increases the risk of cardiovascular disease death by about 2.4%[i], and asthma by 4.4%[ii]. Given the disability and death caused by cardiovascular and chronic respiratory diseases in the USA[iii], and associated medical costs and lost productivity, reducing chronic PM2.5 by 1 µg/m^3 has a benefit of $700 to $1,500 per person. Given that filtration reduces PM2.5 in office buildings by 1 µg/m^3 in the USA[iv], and that people spend an average of almost five hours a day in spaces that would be affected by the proposed laws[v], they will, if they lead to meaningful filtration improvements, provide a value of about $150 to $300 per building occupant.

[i] https://doi.org/10.1161/JAHA.120.016890

[ii] https://erj.ersjournals.com/content/57/6/2003099

[iii] https://vizhub.healthdata.org/gbd-results?params=gbd-api-2019-permalink/149b8d341222d14b41ecf5437a4d1435

[iv] https://doi.org/10.1016/j.buildenv.2021.107975

[v] https://www.bls.gov/news.release/pdf/atus.pdf

09/29/2023

To Whom It May Concern:

I am sending this comments to support bill1127 - Air quality monitoring in schools.

My name is Sari Carel and I am a mother of two girls attending public schools in Brooklyn. I am also a member of Climate Families NYC, a grassroots organization fighting for the livable future of New York families.

My youngest daughter goes to Brooklyn Arbor in South Williamsburg and my 11 year old just started middles school at IS 318. Air quality in my daughters' schools has always been a concern, due to close proximity to the BQE and other roads with heavy traffic and construction. When the wildfire smoke hit dangerous levels this year, schools were ill equipped to manage the situation. They had no way of knowing whether the air inside their buildings was safe.

Schools cannot tackle a problem they don't know exists - schools currently don't have the tools for monitoring AQ and no standards to compare it to.

It is clear that after Covid19 and the wildfires last Spring and Summer the issue of air quality in schools is not going away. That it is only becoming more critical to address it effectively and with a good plan in place.

I urge you to support this bill!

Sari Carel
Brooklyn, 11206

Dear Members of the New York City Council,

I am writing to express my strong support for the proposed New York City bills LS 7316, LS7367, LS 9582, and LS 13447.

I am a Sustainability Lead at Skidmore, Owings & Merrill (SOM), a global multi-disciplinary architecture and engineering firm, where I lead the New York Sustainable Engineering Studio. Our team focuses on incorporating strategies to reduce the carbon impact of every building that SOM designs, while also seeking to support human health and wellbeing. This testimony reflects my own views and not necessarily those of SOM.

Architects and engineers by nature have to prioritize creating indoor spaces that encourage the health and wellbeing of occupants. Air quality–and specifically indoor air quality–is particularly critical. Most of us spend 90% of our time indoors, where the air can be 2-5 times more polluted than outdoors. Children are especially vulnerable to the health impacts of poor air quality; in fact, student attention and performance has been shown to be diminished in classrooms where CO2 levels, as a surrogate of overall air quality, are high due to low ventilation. Additionally, Volatile Organic Compounds (VOC) exposure can result in risk of asthma for young children in addition to eye and nose irritation, headaches, dizziness, liver and kidney damage, and other health complications, according to studies referenced by the WELL Building Standard, a framework used to inform best practices in healthy building design.

The proposed local laws begin to address the reality that our indoor air quality has a significant impact on our health and wellbeing. At my firm, SOM, we have experienced the benefits of air-quality monitoring firsthand. When we redesigned our New York office in 2019, we incorporated a monitoring system to ensure adequate fresh air is introduced and pollutants are mitigated. The value of this system became dramatically apparent this past summer, when New York City experienced record-breaking levels of outdoor air pollution in the wake of the Canadian wildfires. Our system provides real-time data on indoor air quality in our workspace, and showed that it was significantly better than the air outdoors and comparable to normal levels. While unusual, broadcasting this information enables building owners or even tenants to address potential health impacts by action–opening windows for natural ventilation, inserting appropriate filters, and/or adjusting air flow rates in mechanical systems. SOM's system was featured in the New York Times this June as a path to address "age-old obstacles to improving indoor air quality, including the nation's aging infrastructure and lack of regulation."

Monitoring air quality is just the first step. By understanding the quality of our air according to clear and reliable metrics, we can all take steps to mitigate harmful pollutants to improve the lives of New Yorkers. New York already has excellent legislation for energy efficiency and sustainability through the Climate Mobilization Act. Incorporating legislation to monitor air quality advances a holistic approach to sustainability at a citywide scale and puts people, and most importantly children, first.

Sincerely,
Sigal Shemesh
LEED AP BD+C, WELL AP, LFA

The climate crisis is here and decades of disinvestment from low-income communities of color has put these communities at a disproportionate risk to the devastating effects of climate disaster.

According to the NYC Heat Vulnerability Index—an index that identifies neighborhoods with higher heat-related risks—the most heat-vulnerable communities in NYC are predominantly composed of low-income residents of color. These communities have access to 33% less park space than residents in largely white neighborhoods. Repeat exposure to extreme heat can lead to heart, respiratory, kidney, and mental health conditions. Extreme heat can also cause heat stress, heat strokes, and even death. Each summer, an estimated 370 New Yorkers die prematurely because of hot weather in NYC (2022 NYC Heat-Related Mortality Report). Black residents face a higher risk of heat-related illness and death, with death rates two times higher when compared to white residents.

We need permanent infrastructure investments to address these inequalities, and we need them NOW. We need an expansion of Cooling Centers (in quantity but also with a lower threshold for opening) and an expansion of walkable green spaces to improve overall health and well-being, and to offer relief during extreme heat. We also need increased home energy assistance.

Improving air quality is also imperative and I strongly support the package of indoor air quality bills that are being proposed. Air pollution is the greatest threat to human health (Air Quality Life Index). But most of our exposure to air pollution actually happens when we are indoors – on average, Americans spend approximately 90% of their time indoors, where the concentrations of some pollutants are often 2 to 5 times higher than typical outdoor concentrations (U.S. Environmental Protection Agency, Indoor Air Quality).

We need real-time CO2 monitoring and prominent displays of these readings for transparency. We need public outreach and education to increase awareness of indoor air quality and on what steps individuals can take to ameliorate the effects of poor air quality, including but not limited to proper use of respirators which must be provided at no cost by the city. We need improved ventilation and air filtration. For guidance on how to do this, I direct you to The Lancet Covid-19 Commission Task Force on Safe Work, Safe School, and Safe Travel: Designing infectious disease resilience into school buildings through improvements to ventilation and air cleaning (April 2021), which also lists the myriad benefits associated with improved air quality in schools beyond airborne infectious disease transmission (Table 1). We must act swiftly to enact the above measures and we need stronger language in the bills proposed to ensure this happens. Environmental and public health experts, HVAC industry experts, and the communities you serve should all be involved in the decision process.

I also want to point out that a proposal on clean indoor air is incomplete without a universal mask mandate. A universal mask mandate is the easiest, most cost-effective way to clean our indoor air. Mask mandates work, recommendations don't. A study published in the New England Journal of Medicine (PMID: 36351262) looked at what happened in Massachusetts when schools diverged on whether they would follow state policy on masking or continue to mandate masks regardless of what the state did. The school districts that dropped their mask policy from mandates to recommendations had a higher incidence of Covid-19 than districts that kept masking requirements in place even though in some cases, the former school districts were better resourced (ie. Had better ventilation). 100% compliance or enforcement is not the point – the messaging is the most important part of a mask mandate as it conveys the severity of the ongoing pandemic and the urgency for masking.

Thank you for your consideration.

Tyler Filzen

September 27, 2023

Re: Support for Int(s) 1127-2023, 1128-2023, 1129-2023, 1130-2023: Action needed urgently

Dear Members of the NYC Council Health Committee,

Thank you for introducing these bills focused on indoor air quality in NYC schools, commercial, and residential buildings.

175 years ago, women frequently died after childbirth as doctors would perform autopsies and then, without washing their hands, deliver babies. Dr. Ignaz Semmelweis proved a link between hand washing and lower maternal mortality, showing a reduction of ~90%.

It took until the 1980s due to the AIDS pandemic for hand washing and gloves to become standard practice.

170 years ago, Dr. John Snow first proved a link between cholera and contaminated water.

It took another 40-60 years before water treatment and cleaner water became common.

This isn't NYC's first rodeo: Pre-war buildings in the city have very hot radiators in the window precisely to allow residents to open windows for fresh air circulation even in the winter. This was done as part of The Fresh Air Movement in response to the 1918 flu pandemic.

We knew 100 years ago that clean, fresh air reduces transmission of respiratory illness.

NYC and the world just had a wake-up call with the ongoing COVID-19 pandemic. Recent studies have shown that increasing ventilation and filtration for indoor spaces reduces transmission of respiratory and other aerosol transmitted illnesses significantly.

We had a second wake-up call as the skies turned orange and purple in the summer of 2023. Most days now have unhealthy PM2.5 levels outside of several times greater than the WHO guidance of 5ug/m^3. Without filtration, indoors is worse.

Why should we care? Illness and disease from frequent preventable infections and from the effects of pollution cost the city millions to billions in lost productivity and tax revenue from morbidity and mortality. It endangers our children and their future. High CO2 levels in schools not only means higher risk of transmission for illness, but also directly impacts cognition.

The most critical piece of the proposed legislation is real-time monitoring that is publicly viewable on-site and on-line. The key metrics to monitor are: CO2 levels, PM2.5 levels, and TVOC trends. There are "safe" levels established by decades of research that NYC should adopt, and the DOH should not be permitted to "decide" what they are. Monitoring equipment need not be expensive to be effective—in fact, the same $20 PM2.5 laser particle sensor modules used in equipment costing thousands are also in monitors that cost $50. It is similar for NDIR CO2 monitors. There is a validated air quality monitor by a small mission-driven company called AirGradient that costs around $150 each, that includes an online dashboard.

(More information here: https://www.airgradient.com/blog/most-aq-monitors-use-same-pm-modules/)

The DOH and DOE's comments on equipment and technology are misinformed and incorrect.

We cannot take action on what we do not measure, and measuring once each morning at best, or only upon request at worst, is insufficient if the goal is to protect our children and New Yorkers' health.

The city has the unique chance to be a leader, and I am glad the councilmembers are forward thinking on this issue. I hope that NYC passes this legislation quickly, and shortens the timeframes for implementation (months, please, not years). Let's not wait another 100 years before we enact clean indoor air for all New Yorkers.

Thank you,

Wayne

Committee on Health
September 27, 2023
Oversight - Protecting New Yorkers from Heat and Air Quality Emergencies
Testimony Submitted By: Myra Batchelder, MPA

Thanks for holding this hearing and for your interest in improving indoor air quality! My name is Myra Batchelder and I lead COVID Advocacy NY, an advocacy group working on COVID prevention efforts.

I am writing in support of the four air quality bills (Int. No. 1127, Int 1128, Int 1129, Int 1130). I also urge the city to go further. The bills are a good first step, but not enough. We need to ensure that strong action is taken and in a shorter timeframe.

NYC air quality has been at unsafe levels and is expected to continue.

In addition, COVID-19 and Long COVID are still serious health concerns. According to wastewater data, COVID-19 rates are still high across New York City.[1] Currently, many New Yorkers at higher risk for severe COVID-19 are being forced to make impossible choices whether to access needed services because of the COVID-19 risk in indoor public spaces. Even accessing the mail or taking out the trash in people's own apartment buildings can be a dangerous risk when there is inadequate ventilation and filtration in apartment building common areas.

Indoor air quality improvements are urgently needed to protect people's lives and health. New York City needs to invest in clean air infrastructure, including air ventilation, filtration, and monitoring.

We need to take action to improve air ventilation and filtration in all public indoor spaces and make public spaces safer for everyone.

We need to install air quality monitors that provide real-time information to the public so people can assess safety in indoor public spaces.

The city also needs to improve alerts and public education on both COVID-19 and air quality for the public.

Other cities and countries around the world have done significantly more to improve indoor air quality than New York City has, and we should learn from them.

In addition, another key tool for addressing air quality emergencies are high-quality N95 and KN95 masks. I urge you to set up an ongoing free N95 and KN95 mask distribution program, such as the one established in Int 1020.

Improving indoor air quality cannot wait. We need to speed the process. Five years is not enough. We also need to expand the efforts taken.

Thank you!

[1] https://mbcolli.shinyapps.io/SARS2EWSP/

Alexander Riccio - Additional written testimony to be submitted
Committee On Health 9/27/2023 meeting

Firstly, I apologize for slightly late testimony. The week prior to the hearing I myself had a nasty case of COVID that I got from my dad. Though I tested negative at the end of the week prior to the hearing, I, like many, have yet to recover from the effects on the rest of my body that are caused by a virus that infects every cell in my body with an ACE2 receptor. I pushed myself to attend the hearing, knowing I was unhealed, and would be harming my body to attend. I considered it too important a hearing to stay home.

I will be submitting this document first as an abridged document Immediatley before the end of the 72 hour deadline of a 2 hour and 22 minute hearing starting at 1pm, and a more thorough version later tonight.

I encourage you to treat this as an accommodation for extended deadlines as a result of physical injury – since that's what this virus has done to my body.

I casually presented many of my thoughts in a sharable and casual form to my colleages, and some of my aligned-friends, in a Twitter thread on Thursday. You may view it here:

https://twitter.com/ariccio/status/1707450187554169152

I have cut out portions of the video of the council hearing, but have not taken the time to add my own captions. I believe it would be unproductive to consider these clips as needing their own transcripts considering they are merely portions of the video that the City Council has provided to the public.

My further comments are to come in the next submission.

Alexander Riccio - Additional written testimony to be submitted
Committee On Health 9/27/2023 meeting

I apologize for slightly late testimony. The week prior to the hearing I myself had a nasty case of COVID that I got from my dad. Though I tested negative at the end of the week prior to the hearing, I, like many, have yet to recover from the effects on the rest of my body that are caused by a virus that infects every cell in my body with an ACE2 receptor. I pushed myself to attend the hearing, knowing I was unhealed, and would be harming my body to attend. I considered it too important a hearing to stay home. This has resulted in some further unresolved illness.

I will be submitting this document first as an abridged document immediately before the end of the 72 hour deadline of a 2 hour and 22 minute hearing starting at 1pm, and a more thorough version later tonight.

I encourage you to treat this as an accommodation for extended deadlines as a result of physical injury – since that's what this virus has done to my body. After inspecting the code on my end, the website to submit testimony seems written to simply query events by calendar date, and not enforce submissions by 72 hour deadline, so this may end up being a moot point.

I casually presented many of my thoughts in a sharable and casual form to my colleagues, and some of my aligned-friends, in a Twitter thread on Thursday. You may view it here:

https://twitter.com/ariccio/status/1707450187554169152

I have cut out portions of the video of the council hearing, but have not taken the time to add my own captions. I believe it would be unproductive to consider these clips as needing their own transcripts considering they are merely portions of the video that the City Council has provided to the public.

My further comments begin on the next page.

Alexander Riccio - Additional written testimony to be submitted
Committee On Health 9/27/2023 meeting

Firstly, I believe it is telling that Commissioner/Dr. Vasan, and Commissioner Banks were not in attendance. The bills that were presented by the council pose the prospect of – in the words of the testimony of agency representative Deputy Commissioner Corinne Schiff, JD - “a very large and expensive undertaking”. And yet, the commissioners of said departments did not find it worth attending this meeting.

I am also generally curious about the low level of understanding that the Department of Health & Mental Hygiene demonstrated on CO2 metering and air quality monitoring.

If you refer back to the hearing transcript of the 2/14/2023 hearing of the COVID subcommittee, on Page 27, Dr. Vasan says: “I am very familiar with the work of CO2 monitoring to measure air exchange and to measure ventilation”.

Considering that the commissioner himself is “very familiar” with the work of CO2 monitoring, I was shocked to hear the phrase “emerging technology”[1] and a suggestion that they cannot provide “actionable information” from the DOHMH representative. Why is there such a disconnect? Why did the commissioner not say so at the February hearing?

There is something missing here. What information would be *actionable*? Would they really suggest that no action be taken in a space with 5,000ppm CO2? How about 10,000ppm? What about when it’s 40,000ppm, the level where it’s immediately dangerous to life and health? It’s worth noting that the meters that the DOE appears to be using cannot read higher than 5,000ppm. If DOE or DOHMH believe that CO2 must rise to some level above 5,000ppm in a school before action must be taken, they will ***never*** be able to measure a value that ***triggers action***, and thus ***no action will ever take place***.

Further, the very fact that the DOE understands that CO2 should be measured in schools themselves is an implicit admission that it’s useful and actionable. They may reasonably be able to chock that up to public pressure instead of any actual understanding.

It's also worth noting that I have indeed measured CO2 levels close to 10,000ppm (and likely higher than my Aranet4 can measure, the limit is 10,000ppm) in spaces in NYC: https://www.co2trackers.com/places/ChIJK3tvLJtZwokReGHk-DS62eY[2]

[1] See Appendix B – use of CO2 measurement in the 19th century for a brief reference to CO2 monitoring as used in Massachusetts 135 years ago. The digital measurement of these devices is new, but I would hardly call 135 years of measuring CO2 an “emerging” use.

[2] See Appendix A – high CO2 at a bar for a screencapture of such information on the CO2trackers website.

Next, I need to specifically address the dozens of inaccurate or absurd statements made by officials.

Deputy Commissioner Schiff's testimony

During Deputy Commissioner Schiff's opening testimony, the first mention of indoor air quality was in the context of a 311 program for indoor air quality. At the time I am writing this, there are 13,638 311 complaints for poor ventilation in the category of "indoor air quality". I cannot see anything, anywhere, in this database that describes the specific IAQ/ventilation complaint, only that it *was* a "ventilation" complaint. This raises concerns about the meaningfulness of the system - even should it work in the ideal manner – as a mechanism for enforcing control of airborne disease.

Just as important as the lack of specific data about poor ventilation, the very concept of a complaint-driven system is barely useful when it comes to factors like CO2 which are highly dynamic, currently checked only extremely rarely, and very rarely remain outside acceptable limits for the period required for an inspector to visit a location on site.

I have specific experience with each of these concerns. My apartment building, like tens of thousands of others in NYC, has an exhaust-only ventilation system consisting – for each bathroom or kitchen in a vertical line - of a large exhaust fan on the roof, a single air duct running the height of the building, and individual registers (think: a grid of openings with a damper flap that can be adjusted to regulate airflow) in each bathroom or kitchen.

These systems are intended to work by drawing a constant amount of air out of every bathroom or kitchen through that shared exhaust duct. At the time of construction, the developer is supposed to individually measure the flow through each register, and manually adjust the damper such that the correct amount of airflow is pulled through the opening and into the vertical exhaust duct.

Without this damper, or if it is incorrectly adjusted, apartments very close to the fan on the roof *may* see greatly increased rates of exhaust air, and apartments very far from the roof *may* see little or no airflow.

However, the conditions in all buildings vary massively, and this can create conditions that are actively hazardous.

When outdoor temperatures are cold, a high rise building, especially one with a long vertical duct, acts like a large chimney. This is called the "stack effect". This can force additional air into the duct riser at the bottom from lower apartments, and when this

happens, the amount of air that is exhausted at that moment from upper apartments drops. Should the Stack Effect be strong enough, more air will be forced out of lower apartments than the roof exhaust fan can handle. When this happens, air from the lower apartments is pumped directly into upper apartments. This is illustrated in the following slide from a presentation at the 19th Annual Westford Symposium on Building Science:

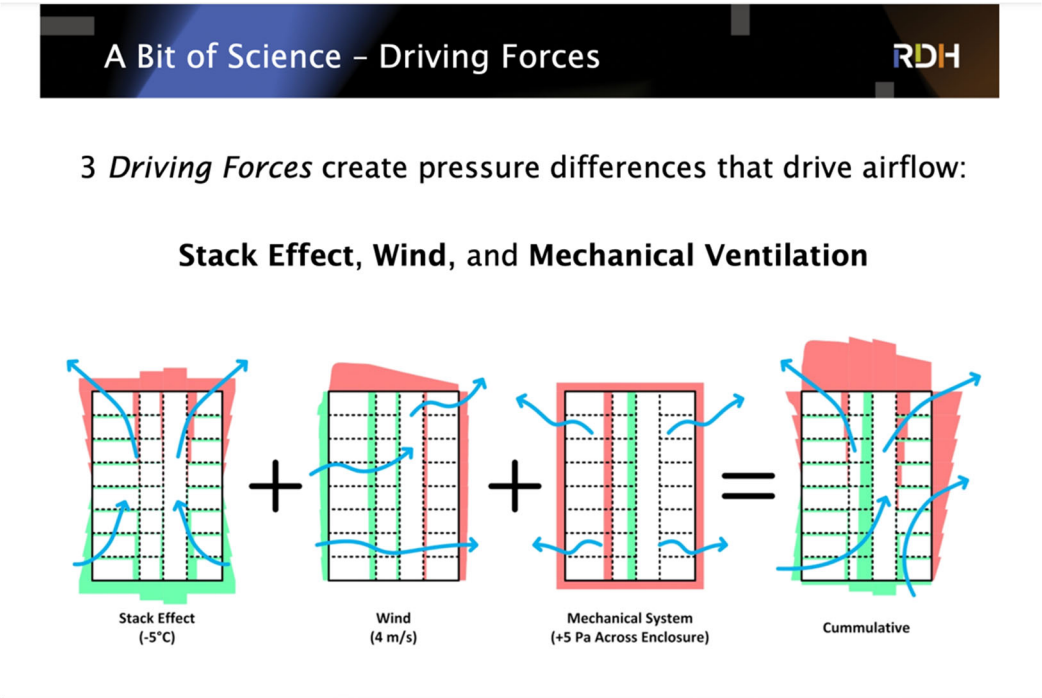


Figure 1: Illustration by Lorne Ricketts, in "Ventilation in Multi-Family Buildings"

In that slide the effect is actually reduced, since the author chose to use a supply-only ventilation system. In exhaust-only ventilation systems, the effect can be much greater.

However, there are also factors like occupants opening and closing windows that worsen the situation. Should an occupant on a lower floor open their window, they may temporarily induce much greater airflow from their unit, and force air into the units above. Should the units above report this condition to 311, it is highly likely that the window will be closed by the time the inspector arrive. Finding no problematic condition, they will mark the request as closed, and no action will be taken.

This is precisely what happens in my building, and countless other buildings in NYC with exhaust-only systems. Building management is entirely unconcerned with the issue, and it never lasts more than a few hours. But those few hours can cause massive problems. The vents may pump foul smells into the apartment (like garbage or foul cooking odors, which has happened to me), but it can also distribute anything that's airborne.

An example video of this sort of issue in my apartment is available at the following URL: https://youtu.be/F_ZFlYRxvfs?si=YEVkdrhTEpdmXYzo

The Council requires transcripts of any videos submitted as testimony. In this video, I am holding up a piece of clean toilet paper near an exhaust grille in my kitchen, and exclaim “It stinks like smoke and fish!”. The vent is backdrafting, and we are getting the pollution and smell of someone’s cooking attempts. They likely opened their window in an attempt to evacuate the smell, and unintentionally introduced it to our apartment.

This is an intermittent issue, so again, building management feels no obligation to improve the situation. Likely[3], because of misconceptions about exhaust only ventilation systems, they would unsuccessfully attempt several “fixes” before giving up. Fixing it correctly would be expensive. Cost happens to be one of the same concerns as the DOHMH.

There also appears to be evidence this has been the case since at least 2001, based on complaints listed in the NYC BIS:

NYC Department of Buildings

Overview for Complaint #:1089870 = CLOSED

Complaint at: 315 EAST 69 STREET **BIN: 1044818** **Borough: MANHATTAN** **ZIP: 10021**

Re: VENT SYSTEM IS BLOWING THE WRONG WAY, ALL DUST AND DIRT IS COMING TO THE APT, CHECK FOR IMPROPER HOOK-UP

Category Code: 53 VENT/EXHAUST - ILLEGAL/IMPROPER

Assigned To: MANHATTAN CONSTRUCTION ENFORCEMENT **Priority:** D

Received: 07/31/2001 13:09 **Block:** 1444 **Lot:** 8 **Community Board:** 108
Owner: 315 E 69 ST OWNRS CORP

Last Inspection: 09/25/2001 - - BY BADGE # 0370
Disposition: 10/03/2001 - C2 - INSPECTOR UNABLE TO GAIN ACCESS - 2ND ATTEMPT
Comments: NO ACCESS

Complaint Disposition History

#	Disposition Date	Disposition Code	Disposition	Inspection By	Date
2	10/03/2001	C2	INSPECTOR UNABLE TO GAIN ACCESS - 2ND ATTEMPT NO ACCESS	0370	09/25/2001
1	10/03/2001	C1	INSPECTOR UNABLE TO GAIN ACCESS - 1ST ATTEMPT NO ACCESS TO PENTHOUSE A	0370	09/18/2001

Figure 2: Screenshot of a backdrafting complaint for my building in 2001.

- Notably, this request had to be closed when an inspector was unable to access the unit. This is yet another problem with a complaint based system.

This is a hazard for the spread of airborne diseases. Any infectious aerosols that are in the lower apartment are pumped directly into apartments on the higher floors.

[3] I know it’s likely because I’ve brought this up with them, and always get some variation of “can’t do anything” or “this is not a problem”.

This is not a theoretical concern. Researchers in South Korea were able to trace outbreaks of COVID to exactly this kind of ventilation system malfunction in a 2020 paper. In that building, the mechanical system was in such poor condition that air flowed incorrectly in alternating directions:

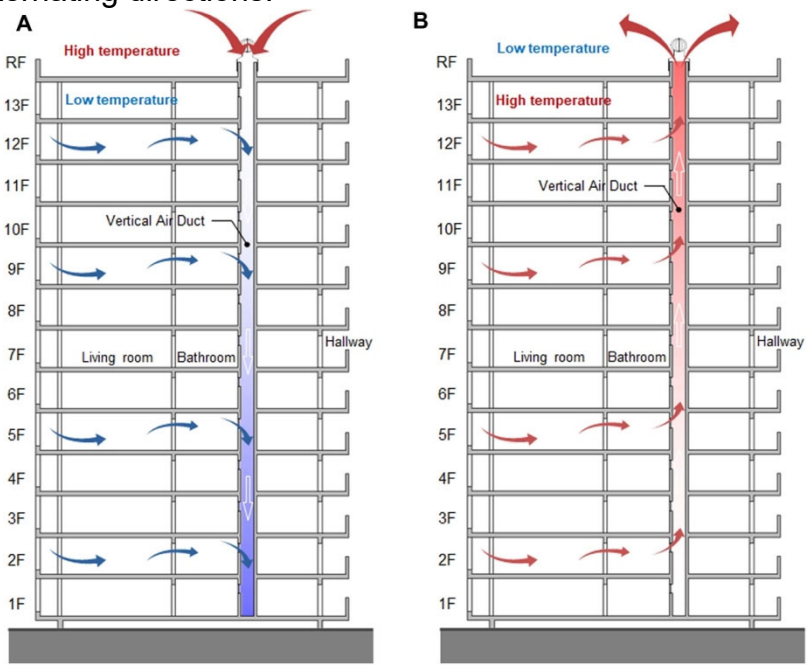


Figure 3: Diagram from "Possible aerosol transmission of COVID-19 associated with an outbreak in an apartment in Seoul, South Korea, 2020"

The outbreaks were as such:

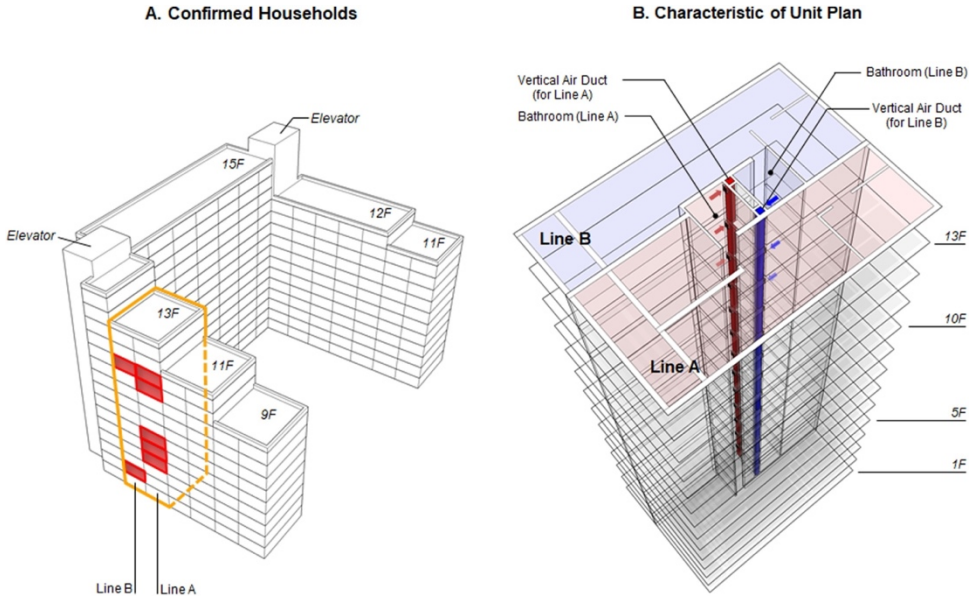


Figure 4: Diagram from "Possible aerosol transmission of COVID-19 associated with an outbreak in an apartment in Seoul, South Korea, 2020"

That these cases were transmitted by way of the shared ventilation ducts is hardly negotiable – extensive environmental surveys found no surfaces contaminated by

SARS-2-COV, and none of the infected parties had been near eachother on any occasion. This is in agreement with the **basic and obvious physics of an *airborne* disease**, and also with the consensus of the aerosol science community.

The Department of Health and Mental Hygiene appears to be entirely blind to this phenomenon. Why would they be familiar? The method of contact tracing that we practiced throughout the pandemic only considered contacting individuals who were within six feet of a case for greater than 15 minutes. Those are mechanisms of contact tracing that may work for a droplet-borne disease, but are of little use for a predominantly airborne, aerosol-spread disease. It is likely that tens of thousands of New Yorkers were sickened by such poor ventilation systems, and also likely that some of those were disabled or killed by their infections.

If asked about it, officials must not be allowed to waive away what is possible simply because they have not looked for it. They have a ***duty*** to protect the health and lives of New Yorkers, that is not a best-effort proposition. As long as they operate on a complaint-based system they will continue to miss the overwhelming majority of dangerous conditions, and continue to fail New Yorkers.

It is also worth noting at this time that there has never been a discussion of the choice to presume droplet spread in the City of New York for a virus that was assumed obviously and clearly airborne on its emergence in January 2020. Such issues would be a ripe subject for a future hearing.

The next subject that Deputy Commissioner Schiff brought up was the suggestion that the department has no need to conduct studies or surveillance of indoor air, either because they are aware of everything to be aware of and how to enforcer the parameters in question, but also that such parameters may lack health based standards:

The bills require measurement of air quality components that are already understood and have enforceable standards, so there is no need to study them, or have no health based standards, so we would gather information but not be able to use it to address indoor air quality concerns

---

I am telling the council, on the record, that this is errant nonsense. I also believe that it hardly self-consistent with other testimony in the very same hearing.

She is first claiming that some air quality parameters are already understood. This is inconsistent with:

1. Her own testimony:
    a. Later testimony under questioning by CM Schulman, she clearly and unequivocally states that there is no broad indoor air surveillance in NYC:

CM Schulman: "What monitoring of indoor air quality exists in city buildings as of today? Are there plans for expansion in the near future?"
Deputy Commissioner Schiff: "Indoor air quality is an umbrella term that covers scores of components, so I would say for example there's monitoring in residences of carbon monoxide, everyone should have a carbon monoxide detector[4], but there is no broad surveillance system across city buildings. And really, that wouldn't be appropriate or necessary. Instead, we would like to let New Yorkers know about ways to improve their indoor air quality, and keep it at high quality. But the idea of a broad for scores and scores of parameters[5] doesn't really make sense."

---

b. Later testimony under questioning by CM Powers, she again affirmed there is no actual collection of information about IAQ in a systematic way:

CM Powers: "When you talk about data that we already understand, can you explain that? Including what are you collecting? Like, in this building here, that we're sitting in today, it's a municipal building, what data is Department of Health collecting today about the air quality in this building? For instance, that wouldn't say you understand or are already collecting? What are you collecting today? Right here in this building today?
D.C Schiff: "We're not collecting, there is no program to broadly collect data on indoor air quality?"
CM Powers: "Correct. That's why we're here today. But you're also taking the position that we shouldn't, and that even if we had the data there'd be no action to take. I disagree with that. I think that if we had some – in buildings particularly where we don't have a mechanical ventilation system – which seems to be many – during the COVID crisis[6] when it was well documented that [there] were ventilation issues all throughout our city school buildings - and I can pull up, I can read you the articles about them, they were all 2020, 2021, documenting [for] the first time parents, and teachers and leaders in the city taking a look

---

[4] N.B. This is not a surveillance program – this only produces an alarm that the occupant may respond to in the way of their choosing. There is no guarantee any information is recorded or collected. Should it be a combination carbon monixde and smoke detector, it's entirely possible the response is to "remove the batteries of the device".
[5] There are only seven measurement parameters in the bills.
[6] It's worth nothing that it's been only two months since the most recent time someone I know became fully bedbound after a case of covid. It's worth keeping them, and those who will join them in this horrible fate, in mind as we chose our course of action. See Appendix C – well respected hacker and information security professional disabled by Long Covid from a June 2023 infection for screenshot.

at air quality and ventilation because of the concern around airborne pandemics."

---

2. The observation of hundreds of New Yorkers, including myself, of conditions that are way beyond the bounds of any reasonable enforceable standard, or most definitely should be considered beyond the bounds of any standard.
    a. Tweet by Sarah Allen: "From a friend at another D 15 school who doesn't want to use her name: "Weonly have window ventilation too. No one checks or asks for windows to be open. I check the CO2 daily in multiple rooms—it's usually above 2000 and can go much higher. Doesn't bode well for absences.""
    b. Tweet by Gyda Arber with a picture of a graph from an Aranet4 showing a peak CO2 2351 in her child's classroom.
    c. The article "NYC Schools Bought Weaker Air Purifiers. Now Underventilated Campuses Are More Prone To COVID Cases" in Gothamist.
    d. The article "More NYC teachers are frequently out sick following COVID-19 pandemic" in Chalkbeat.
    e. Appendix A – high CO2 at a bar
    f. …and hundreds more examples

She then says that there are no health based standards for some air quality parameters.

This is *almost* literally true in the most lawyerly way – how do you define a health based standard? Who issues it? The CDC has yet to issue regulations or standards governing indoor air quality – though they emphasize endlessly but ineffectively that their guidelines should be considered a floor, not a ceiling.

The WHO has not, and likely will not within our lifetime, set standards for indoor air quality in the context of airborne disease transmission,

The first version of ASHRAE Standard 241, Control of Infectious Aerosols is indeed available for use. It is exceptionally detailed, and provides exceptional and thorough answers to many of the minutia involved in mitigating the spread of airborne disease. This is an engineering standard, not a regulatory standard. It is very useful for the design of individual buildings. I have personal qualms with this version of the ASHRAE standard, and would not encourage it's translation into regulations without significant amendments to ensure successful implementation and enforcement.

However, in the general sense there is:

1. A broad consensus in the Aerosol Science community that realtime air quality monitoring is crucial to the control of infectious diseases:
    a. Tweet from Dr. Jose Luis-Jimenez: "I suggest that every public establishment should have an easily viewable (NDIR) CO2 meter

(examples below). This can be done now for $200, less if done massively. Everyone would learn quickly which spaces need ventilation. Should guide who can re-open and not, or how many ppl”

2. (and) A robust academic base (3 of hundreds)
    a. “Practical Indicators for Risk of Airborne Transmission in Shared Indoor Environments and Their Application to COVID-19 Outbreaks”
    b. “Systematic way to understand and classify the shared-room airborne transmission risk of indoor spaces”
    c. “Quantifying transmission risk of SARS-CoV-2 in different situations”

Lastly, it is ***obviously*** nonsensical ***in the general sense***, that information about the contents of air in a space cannot be used to mitigate the spread of ***airborne*** disease, or even to generally improve the quality of ***the air in said space***. ***Obviously***, information about air in a space can be used to guide mitigations that ***remove bad stuff from the air***. I don’t know how much plainly clearer I can get about it. Given the clear fact they are unaware of or have taken no interest in the worst conditions seen around our city, it is hard to fathom any explanation other than the underlying concern of cost and difficulty.

In that context, I would like to remind the council of the enormous instantaneous cost during the outbreak of a new pathogen (like the cost of the shutdowns of 2020), but also the longer term costs associated with the endless and relentless infection of every the entire city as much as four times a year. Sick people can’t work.

That’s to say nothing of the economic cost of people who continue to develop Long Covid, permanently removing them from the City’s economy, and to say nothing of the costs associated with the *next* pandemic.

Testimony of Department of School Facilities CEO John Shea

DOF CEO Shea made a number of claims that were implausible, others confusing, and some that I believe were unwittingly misleading – all with an authority that obscures the absurdity of the situation.

First, he makes a claim about the efforts of school custodians to maintain safe indoor air:

"First of all, every NYC school has a custodian-engineer in their building and one of the things that they're required to do every morning is to walk through the building and ensure that the building's ventilation is working, if they find any issues or it's not working, even in one particular space, they escalate to their deputy director of facilities for priority repair. They also update an online tracker which is available publicly, people can go in and see the status of the ventilation in any of the classrooms, instruction spaces in NYC schools, and every week they sign a attestation survey that they're maintaining their ventilation systems."

I would like to break this down step by step.

"one of the things that they're required to do every morning is to walk through the building and ensure that the building's ventilation is working"

This immediately espouses a severe misunderstanding of the problem at hand. By checking ***in the morning***, you will only be able to tell if:

1. Mechanicals ***appear*** to be working as designed and appear to be working at that moment.
2. Portable filters ***appear*** to be working and in use as intended, and only at that moment.
3. Windows are open, ***or apparently, "operable", aka capable of being opened in theory[7],*** at that specific moment.

There is ***no possible way*** for them to tell if:

1. Mechanicals were sufficiently capable when originally specified.
2. Mechanicals are indeed capable of, and/or in actual practice maintaining the indoor air at an acceptable level of cleanliness across the wide variety of conditions throughout the school day – ***the rooms are empty and have been empty all night or weekend!***
3. Mechanicals fail, or otherwise do not operate ***during the day*** for any other unknown reason.
4. Portable filters are ***kept*** in use ***throughout the day***.
5. Windows are closed at any point ***throughout the day***.

Given the large size and hundreds of rooms of many school buildings, we should ***also*** consider it implausible that any custodian could do a ***thorough and complete check***

---

[7] The absurdity of checking whether windows are merely operable instead of… y'know… open… should *perhaps* instill further questions about the intelligence of the people charged with educating future generations. I hate to be so mean, but, really? Do they understand air? What is the thought process behind this? Or was there a complete absence of thought?

every morning on top of all their other duties. Honestly, that part just doesn't even pass the smell test. Just ask Mr. Shea how long the longest time-to-completion is, add in their other daily tasks, and compare it to their arrival time.

if they find any issues or it's not working, even in one particular space, they escalate to their deputy director of facilities for priority repair.

1. The *very fact that kids got sick with COVID in schools in 2020, 2021, 2022, and continue to get sick*, indicates that ***issues are being missed***.[8] This contributes to the ongoing increase in chronic absenteeism, declining student performance, and teacher absences due to illness.
2. This does not match countless anecdotes of teachers and parents, some of which I'll include:
    a. Tweet by Sarah Allen: "From a friend at another D 15 school who doesn't want to use her name: "Weonly have window ventilation too. No one checks or asks for windows to be open. I check the CO2 daily in multiple rooms—it's usually above 2000 and can go much higher. Doesn't bode well for absences.""
    b. Tweet by Sarah Allen: "[morning measurements that don't actually take place] was what was happening in 2021. Our custodians were receptive when I explained how it all worjs, but their bosses and the DOE only got CO2 readers for safety theater and their use hasn't been encouraged in the vast majority of NYC schools for years."
    c. Tweet by Christopher Werth: "I've been inside a number of NYC school buildings over the past month and in all of them I've seen dozens of unplugged Intellipure air purifiers that DOE purchased and serviced at nearly $100m — despite questions over their efficacy —pushed into corners, unused and forgotten.
    d. Tweet by "Naguib Mahfouzball": "Friendly reminder to NYC teachers: your custodians are supposed to be cleaning your Intellipure filters every month. Has that been happening? Crack the lid and see!" (followed by a picture of an intellipure prefilter that's extremely dirty)
3. The very fact that classrooms are considered in good working order when "operable" windows are considered an acceptable mechanism of ventilation should call into question the concept of ***an issue in the organizational culture and the priority of repairs as considered by DOE***.
4. The mention of "even in one particular space" generally reminds me of the comparison to the public health approach towards safe and drinkable water. We'd never accept "even one glass" of water full of Cholera acceptable. I get the

[8] Someone may claim that spread of COVID and COVID infections cannot be attributed to the school system. This meets all the criterial for a lie, but I will not call it that. The only way to make a claim like this as fact is if the DOE sequenced every single COVID case to determine the chain of infection, and whether or not the chains connect via in-school transmission. Not only has there been zero (publicly known) effort by the DOE to sequence cases, but I have heard rumors that there were internal discussions that rejected sequencing for fear it would reveal in-school transmission, and thus, legal liability. You can start see how the layers of denial stack up to form our current predicament.

> vague feeling that many consider just one classroom in a building that hotboxes COVID to be acceptable.

They also update an online tracker which is available publicly, people can go in and see the status of the ventilation in any of the classrooms, instruction spaces in NYC schools

This statement is premised on the observations being correct. See section: “one of the things that they’re required to do every morning is to walk through the building and ensure that the building’s ventilation is working”.

and every week they sign a attestation survey that they’re maintaining their ventilation systems

This strikes me as an entirely meaningless, but perhaps a legal-liability-sufficient measure of enforcement. Given the many clear instances of underperforming or entirely absent ventilation systems, I suspect it wouldn’t even hold up in that context. If a parent or a teacher were to sue over a COVID infection – as we must assume they may at some point, and has been successfully litigated on the side of the worker in Arizona – would the department be able to claim they trusted these attestations?

Either way, how does the department have any idea that the attestations are correct and valid? Are they going into a majority of schools to check this? Given that the department says that the “Health and Safety of our students is our highest priority” why would they check any less than one-hundred percent of schools?

The only tool that the DOE *did* have to try to see if schools were correctly attested *after* the fact was to track the number of covid infections with surveillance testing[9], and they have given that up.

On the flip side, it is substantially more obvious to see if real-time air quality meters are being farkakteh’d – for example: numbers reported should follow general daily patterns, but not be too repetitive. Numbers should vary slightly, but measurably, with outdoor conditions. Those are more complex methodologies similar to cryptanalysis that I am very vaguely familiar with from my infosec background. The meters should be connected and collecting data. That’s a much more easily checkable method. All three methods for detecting false or manipulated data could easily be implemented in software, run centrally, and automatically suggest locations for follow-up. That this has not occurred to the administration boggles my mind, and calls into question their fitness to design such an air surveillance program – a point I make in many places.

[9] Given the majority of all infections appear to STILL be ASYMPTOMATIC, they must not be allowed to claim symptomatic surveys are adequate.

Alexander Riccio - Additional written testimony to be submitted
Committee On Health 9/27/2023 meeting

Followup between CM Powers and CEO Shea about Boston's program

Further on, CM Powers prompts Shea about whether the BPS program has the wrong technology – is that why they're opposed?

Shea responds:

"One thing we feel that we have a system that is just as good if not better and in alignment with the CDC guidance which is always saying that you should be spending your resources on maintaining and upgrading your ventilation systems as opposed to providing passive solutions that don't actually improve air quality"

We do not have any system to monitor air quality in real time, which is definitely not better than a system that monitors air quality in realtime.

There is no such CDC guidance. There is very good reason the CDC has put out no such guidance. In order to understand which ventilation systems need upgrading and which need repair on the scale of a citywide school system, you must have accurate, comprehensive, and systematic, data about the performance of ventilation systems across schools citywide.

It is unclear to me why sensors that measure air quality in realtime are considered "passive", while it's "active" to measure air quality parameters once a day.

"Passive" vs "active"

Exchange between CM Powers and CEO Shea regarding a Gothamist article

A bit later in the hearing, CM Powers continues his line of questioning that was exceptionally well delivered, and did a good job probing officials.
Shea's response:

"we have a number of buildings that only have windows for their ventilation, but custodian engineers in those buildings also know that that is the integral part of their ventilation system, so they make sure that the windows are operational, if there's a central exhaust system that draws air through the building that has to be working. So just

> *because those buildings were built at a time when the code required that as the ventilation system doesn't mean that they don't check and make sure that that is working. And they still have to update their tracker*
> *[comment about finding the Ventilation Dashboard]*
> *You are correct there's a difference between seeing parameters like the Boston system has as opposed to the functionality of the ventilation system but we also feel very strongly that operating ventilation is the most important thing as opposed to if you look at the Boston dashboard there are sensors that are out of calibration there are sensors that are not working so the value of the data is only as good as what you are getting back. We feel that having a custodian engineer in the building with a device that can measure those same parameters and respond to concerns in the building and have conversations and then escalate issues that are beyond their ability is the best way to handle that.*

This is a very odd response. Let's break it down.

> we have a number of buildings that only have windows for their ventilation, but custodian engineers in those buildings also know that that is the integral part of their ventilation system, so they make sure that the windows are operational

Again, I am disappointed to hear that after three years and having said this already in the same hearing, he seems to equate "operational" with open. Windows do not ventilate when they are closed. I am apparently under the mistaken impression that this is obvious to anybody who has spent time in buildings built after 1774.

> if there's a central exhaust system that draws air through the building that has to be working.

Checking whether the fan motor is spinning and whether there is air leaving the housing on the roof is not a bad idea, but says little about the actual pattern of ventilation in spaces connected to shared exhaust risers. See above section: Deputy Commissioner Schiff's testimony.

So just because those buildings were built at a time when the code required that as the ventilation system doesn't mean that they don't check and make sure that that is working.

Checking whether a system that was designed to meet insufficient codes (windows-only) is indeed operating in the way that it was designed (to meet insufficient windows-only old codes) is not much of an improvement on "having only windows".

You are correct there's a difference between seeing parameters like the Boston system has as opposed to the functionality of the ventilation system

CEO Shea continues to make an odd distinction of superiority between whether the system is "operating" instead of… collecting data in realtime as to whether the operation of the system is sufficient. Without realtime performance data (air quality monitoring)

(CUTOFF – WILL AMEND?)

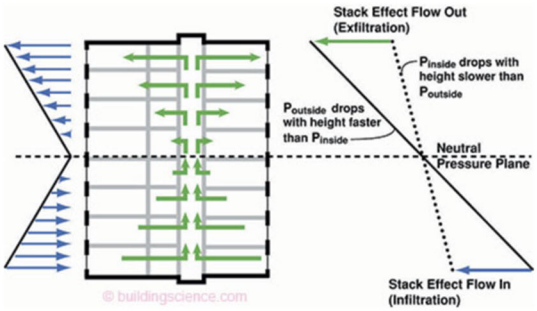


Figure 7: Stack effect in a multi-story building - Stack effect driven airflows in multi-story buildings compromise smoke control and fire safety, adversely affect indoor air quality and comfort as well as increase operating costs for space conditioning energy

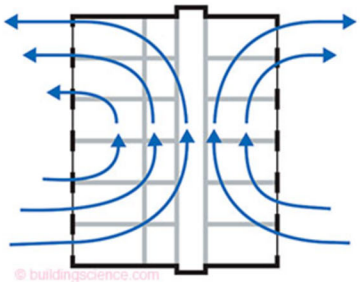


Figure 8: Stack effect driven airflow - The air in lower units ends up in the upper units

Figure 5: Stack effect as illustrated by Building Science Corporation

Alexander Riccio - Additional written testimony to be submitted
Committee On Health 9/27/2023 meeting

Appendix A – high CO2 at a bar

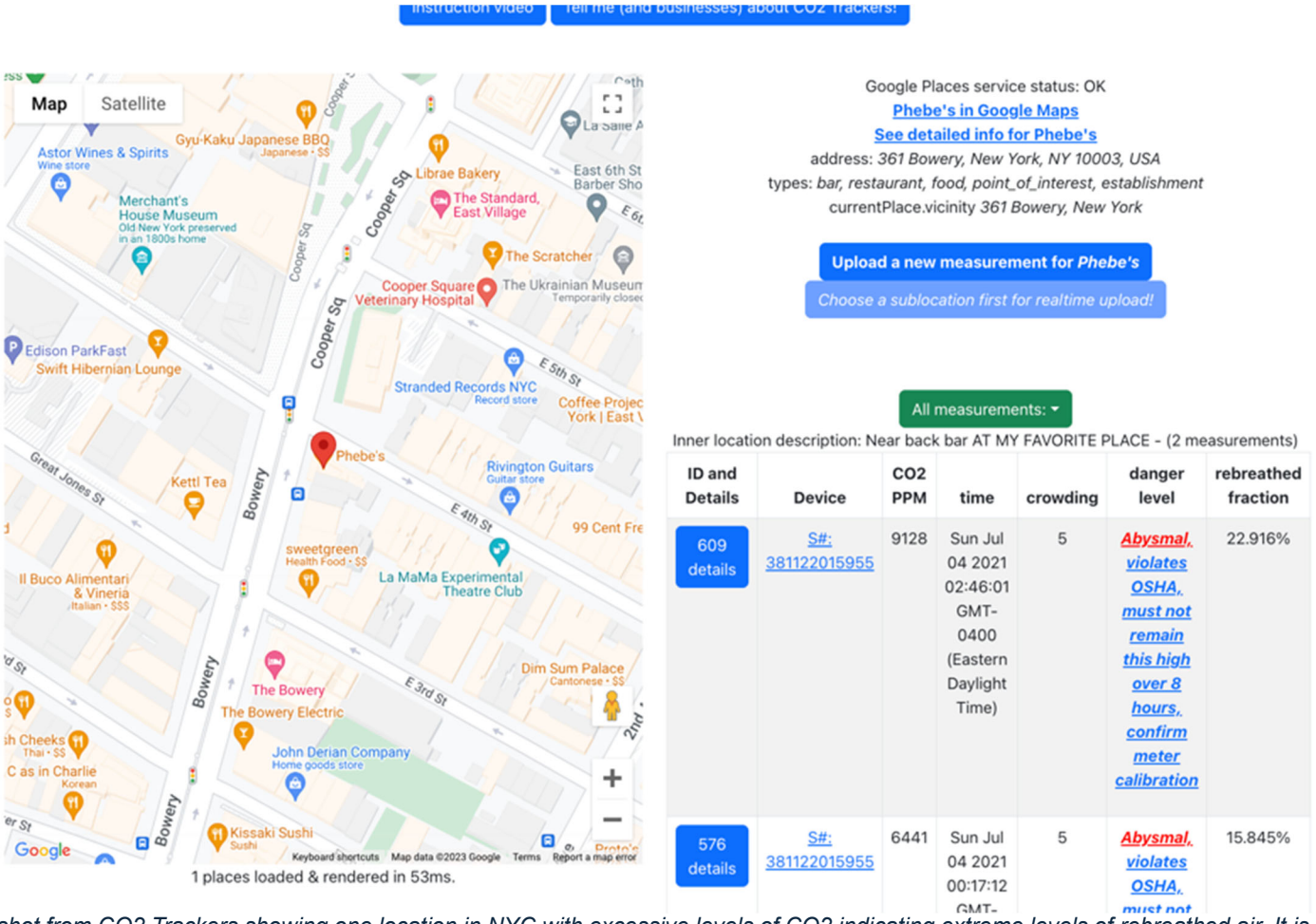


Figure 6: Screenshot from CO2 Trackers showing one location in NYC with excessive levels of CO2 indicating extreme levels of rebreathed air. It is likely representative of ***countless*** *nightlife establishments, and it would be* ***absolutely and entirely unfair for DOHMH or DOB to take any enforcement actions against this establishment that it does not take against all establishments****. I will be* ***extremely upset*** *if I find they have been singled out for any kind of enforcement by my inclusion of this establishment in my testimony.*

Appendix B – use of CO2 measurement in the 19th century

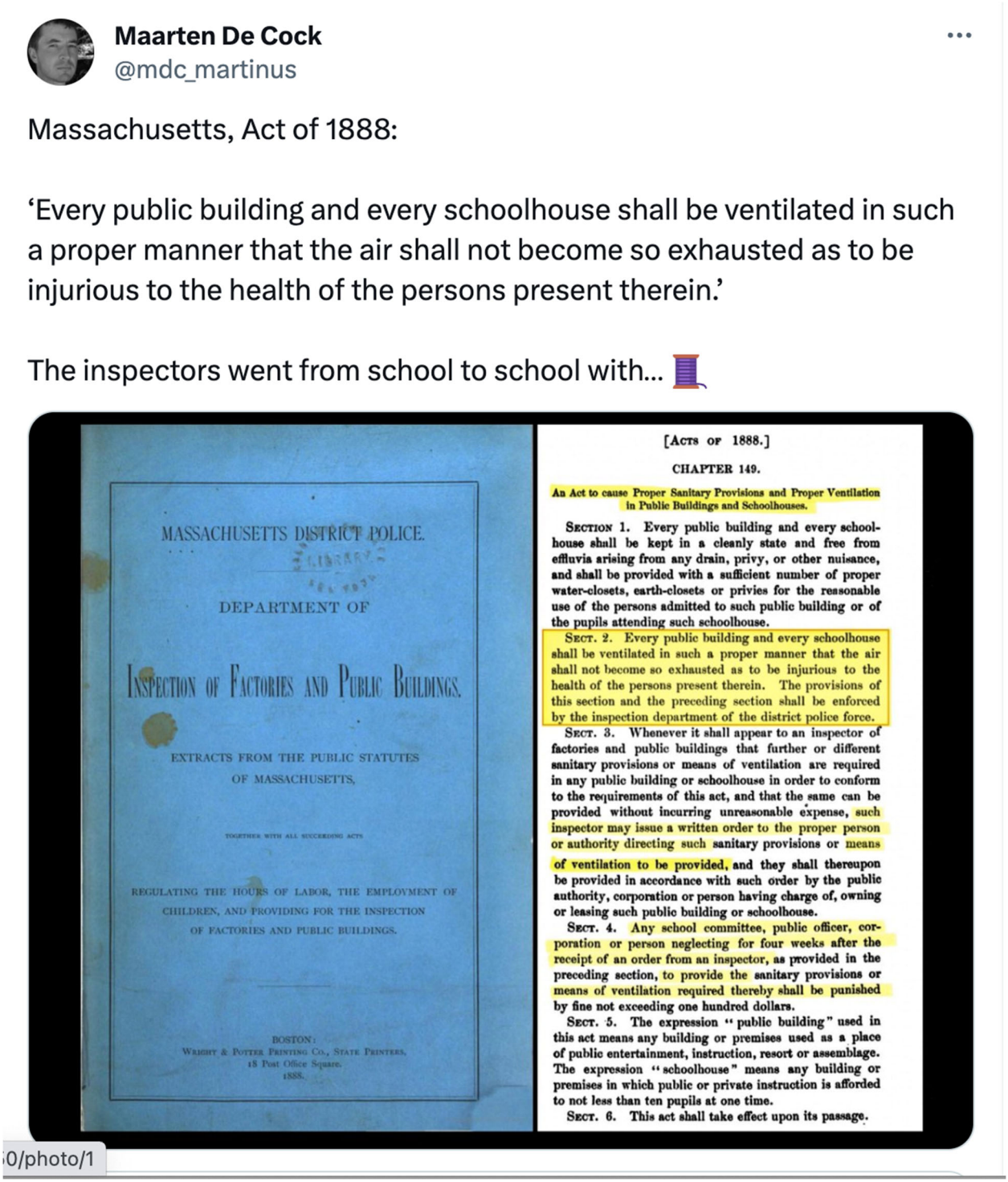
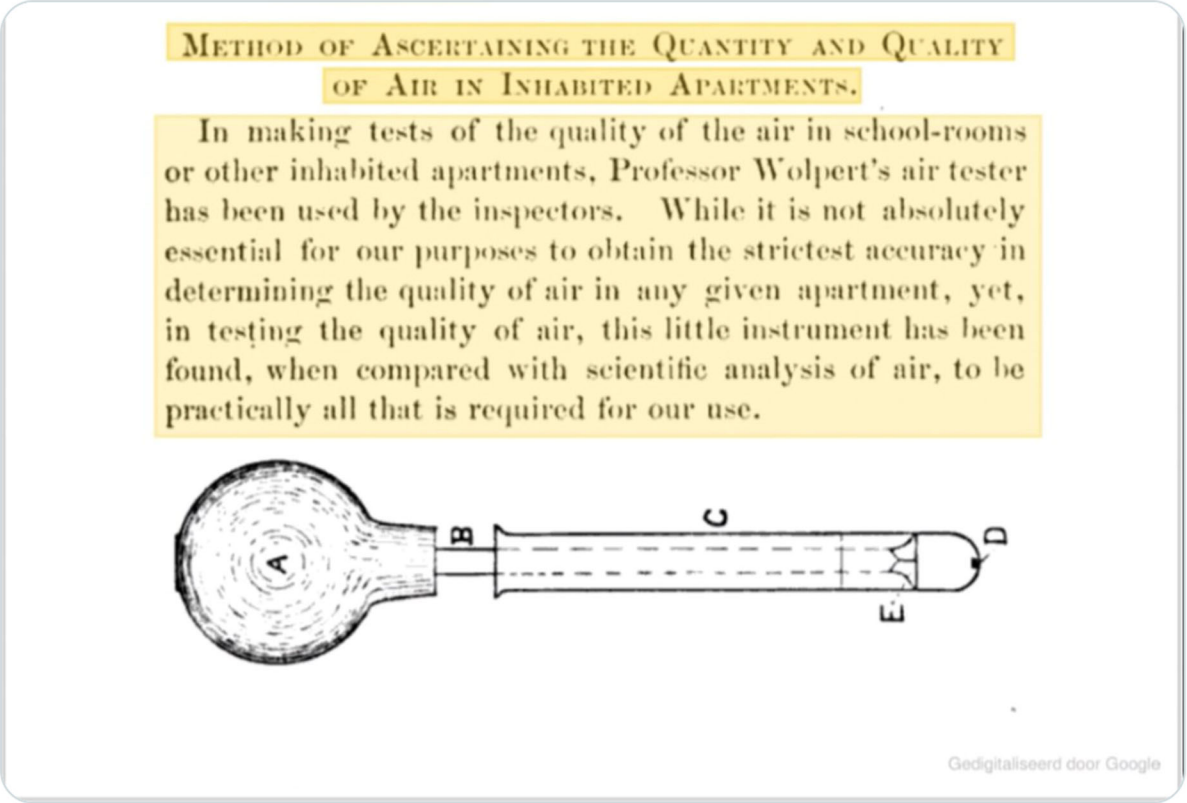


Figure 7: Maarten De Cock's tweet about Massachusetts school ventilation and CO2

Maarten De Cock
@mdc_martinus

...their 19th century portable CO2 meters: ‘air-testers’ made by the German Professor Wolpert.

If these tests showed insufficient ventilation, the inspector wrote an order and later revisited the school, tested the air again to see whether the ventilation was indeed improved.



METHOD OF ASCERTAINING THE QUANTITY AND QUALITY OF AIR IN INHABITED APARTMENTS.

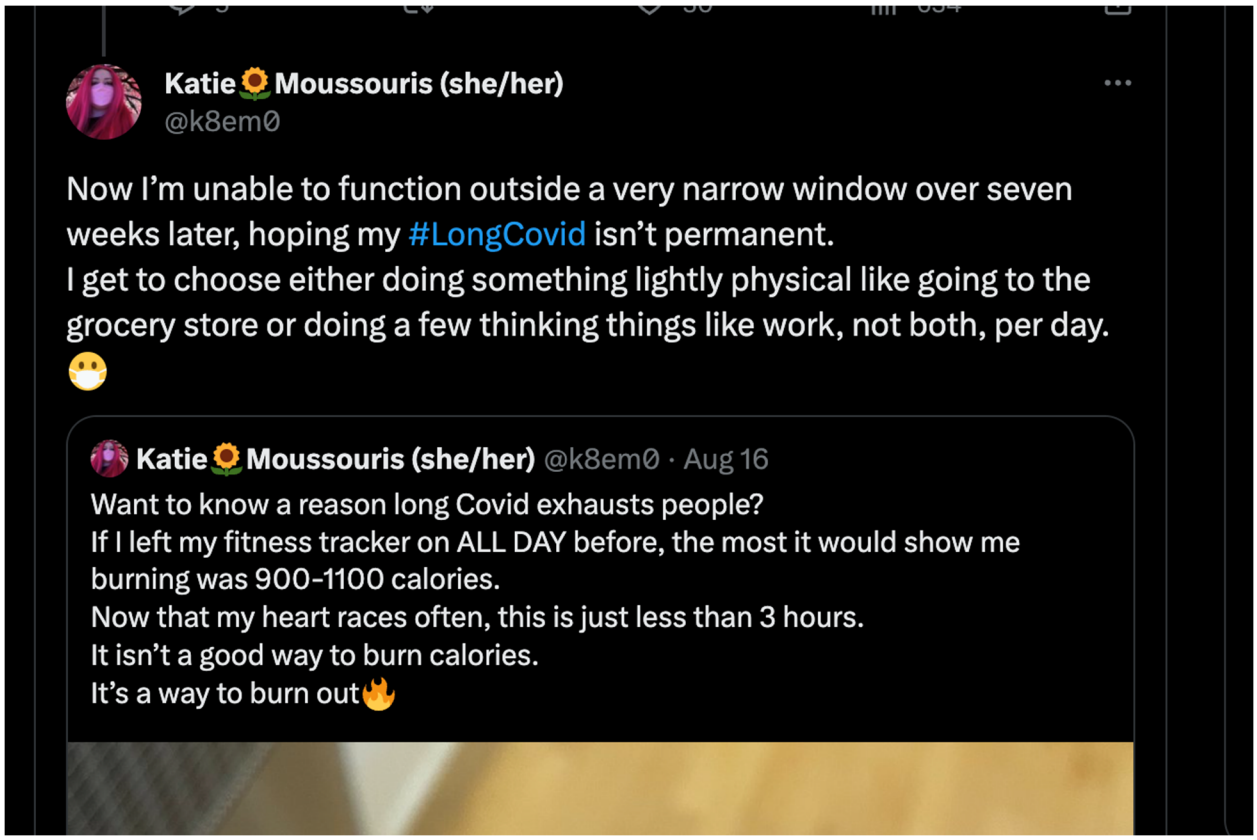
In making tests of the quality of the air in school-rooms or other inhabited apartments, Professor Wolpert's air tester has been used by the inspectors. While it is not absolutely essential for our purposes to obtain the strictest accuracy in determining the quality of air in any given apartment, yet, in testing the quality of air, this little instrument has been found, when compared with scientific analysis of air, to be practically all that is required for our use.

11:59 AM · Sep 7, 2023 · **6,680** Views

Figure 8: Maarten De Cock's 2nd tweet about school ventilation in the 19th century.

Alexander Riccio - Additional written testimony to be submitted
Committee On Health 9/27/2023 meeting

Appendix C – well respected hacker and information security professional disabled by Long Covid from a June 2023 infection



Alexander Riccio (@co2trackers) @ariccio

Sep 28 • 68 tweets • ariccio/status/1707450187554169152

I will be clipping the video shortly.

> **Alexander Riccio (@co2trackers)**
> @ariccio · **Follow**
>
> Hearing is going.
>
> 5:35 PM · Sep 27, 2023 from Manhattan, NY
>
> 11 Reply Copy link
>
> Read 1 reply

Cutting out the next segment made me so angry my eyes started to get blurry i need a moment

Shea declares "I want to be clear on the record, that the health and safety of our students is our highest priority. The air in all of our schools is safe"

He says this about the air that gave hundreds of thousands of students COVID, RSV, and some, pneumonia.
Some of those kids were disabled by long COVID, and a few DIED because of that air. That's not safe. That's a LIE.

@Lynn4NYC @KeithPowersNYC I think we can all agree.
We cannot fix what we do not admit.

Let's go back a bit.
He's talking about this air:
https://x.com/Mssarahmssarah/status/1701717428697174154?s=20

This air:

@MichaelElsenRoo

More NYC teachers are frequently out sick post-pandemic
Elevated teacher absences can have a ‘tremendous effect’ on school operations, said Roony Vizcaino, the principal of the Urban Assembly School for Global Commerce in Harlem.

https://ny.chalkbeat.org/2023/9/25/23889772/nyc-teachers-chronically-absent-covid

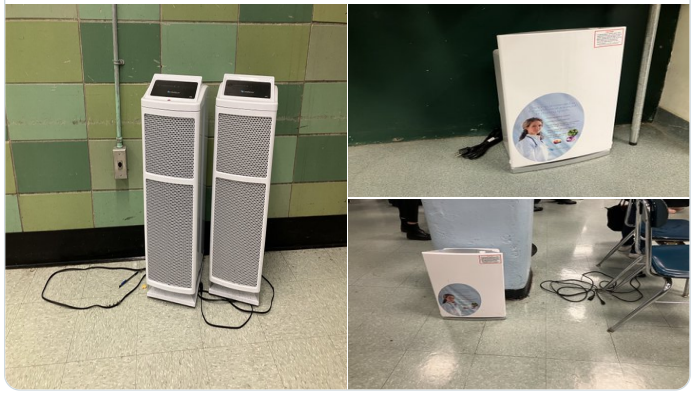
@MichaelElsenRoo THIS
AIR

Alexander Riccio (@co2trackers)
@ariccio · **Follow**

Replying to @ariccio

Also, a few examples of custodians clearly lying on the forms:

Christopher Werth @c_werth
I’ve been inside a number of
NYC school buildings over the past month and in all of them I’ve seen dozens of unplugged Intellipure air purifiers that DOE purchased and serviced at nearly $100m — despite questions over their efficacy —pushed into corners, unused and forgotten.



10:52 PM · Sep 28, 2023

13 Reply Copy link

Read 1 reply

@MichaelElsenRoo this air

@MichaelElsenRoo CM powers JUST read you the article by @MoNscience and @jeffwilen https://x.com/ariccio/status/1707539938441331037?s=20

@MichaelElsenRoo @MoNscience @jeffwilen The one where you check if the windows are operable but not OPEN

@MichaelElsenRoo @MoNscience @jeffwilen The air where you just spent 40 minutes saying the only time you want to know how safe it is is when you test it first thing in the morning and not any of the times the kids whose health and safety is your "highest priority" are actually breathing said air

Bullshit.

This man did not treat the city council with respect. If he did, he would not have given them bullshit.

Note that he himself said he wanted to be "on the record". That's why I'm not letting him have an inch. If you want to make strong claims, AND do it on the record, don't expect to make bullshit instead and get away with it.

@MichaelElsenRoo @MoNscience @jeffwilen

https://www.youtube.com/embed/XPrRxhYJMkQ

I really would like to believe that he honestly believes what he's saying.
I've heard stories from my dad about how hard of a job it is to be in charge of things like this.

I also know that most people in his position are consuming the same poor information diet that everybody else is.

But he did not give himself wiggle room.

Schiff is a talented lawyer! She knows how to word these things. She didn't make any claims that bold.

This man said it himself, he was being clear.

@MichaelElsenRoo @MoNscience @jeffwilen Oh shit I forgot to untag the reporters in the middle of my anger

@amandalhu can we get the kids to make some tiktoks with this clip?
> the air is safe
> cut
> all the insane unsafe shit that is the air

Mr. Shea, if you ever end up reading this for some reason, honestly, I understand that your job is on the line.

I understand that if you *don't* declare the schools safe, there will be a big panic that will at some point means the mayor will summon you to Gracie Mansion, scream at you for an hour, demand your resignation, and probably try to make sure you never have a job again.

I understand the position. It sucks. It's not fair that you're in that position. Society has failed on this issue.

But right now you're one of the people standing in the way. It's the health and safety of children for christsakes. That should be obviously the more important thing, no?

I don't have kids myself, but I would like to someday. They will likely end up in the same schools. Please.
@amandalhu Schulman follows up with a question about what type of sensor the BPS uses. And how good is their data? Shea doesn't know.

@amandalhu Just kinda amazed they haven't done this homework.

As I mentioned yesterday, if you're playing some kind of long running drinking game about the "CDC guidelines", you're not sober yet.

Powers asks if he's criticizing the boston project.
Shea says, lol, ours is better and "in alignment with the cdc guidance"

Ok guys, which part of the CDC guidance says you should upgrade and maintain ventilation instead of "providing passive solutions that don't actually improve air quality"

Schulman asks several questions about heat indexes. This is important stuff, but outside the scope of this 10 hour thread :)

CM narcisse asks a few Qs that have already been asked and answered, with much the same language, will skip here.

CM Narcisse asks a question about penalties for buildings in noncompliance.

Schiff responds about the air quality enforcement team.

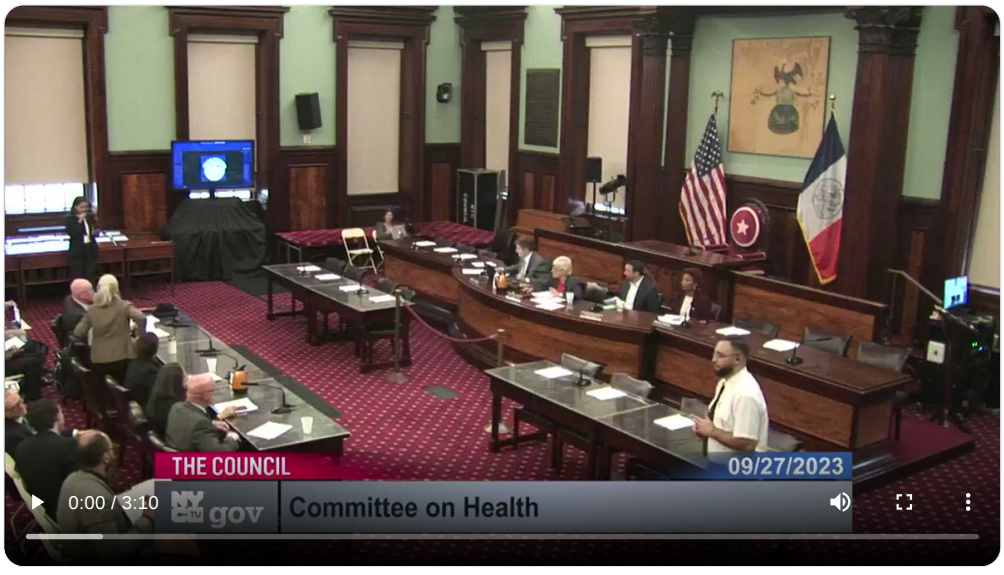
I don't actually know of any buildings who've faced penalties. I'm sure there are dozens. But it's a complaint driven program at its core. It's going to be really rare. Air is invisible after all.

A few more qs about heat.

@MarkLevineNYC then testifies remotley.

He speaks about the history of pandemics in the city. Makes an odd remark about airtightness. ??
But hits all the other marks.

He gets it. BP levine, please, let's get in touch! I've tried a bit before, but would like to try properly!



@MarkLevineNYC A staffer for BK BP Reynoso was next. She spoke about heat.

@MarkLevineNYC First public testimony was by Nina Prescott, of the Rocky Mountain Institute. No twitter account to tag, but here's a linkedin.
https://www.linkedin.com/in/nina-prescott/

@MarkLevineNYC Mine was next! I didn't have time to print my testimony, so I tripped up a few times with my phone screen 😅

@MarkLevineNYC After me was testimony from a representative for a company that sells additive air cleaners which I will not mention.

@MarkLevineNYC Last public testimony was a lawyer for Carrier corporation. Oy. The lobbyists.

@MarkLevineNYC I'm not gonna share the marketing lmao. That's what it was. Marketing.

@MarkLevineNYC CM Schulman asked the panel what standards already exist for IAQ. Y'know, the kinds of things that officials spent an hour saying DON'T EXIST. The carrier rep answered this first. And did a good job.

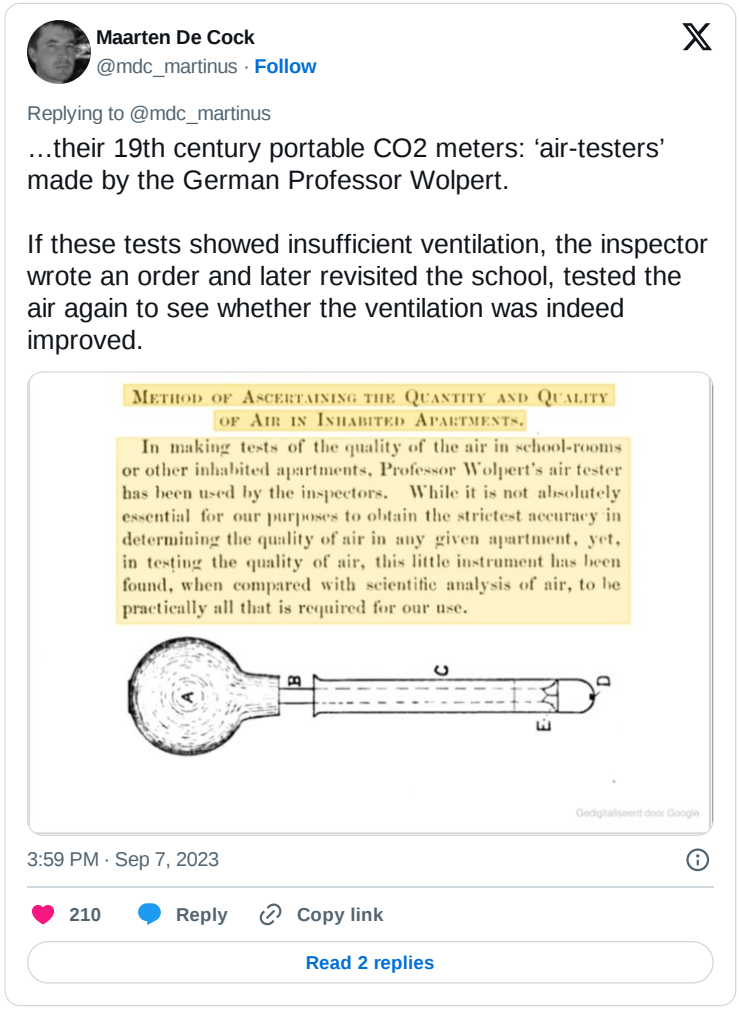
@MarkLevineNYC CM Schulman asked the panel what stakeholders should be involved. Again, the carrier rep was pretty polished!

Next, @Lynn4NYC asked if anybody had a response to "the administration's testimony that the science isn't there yet".

I apologize for snickering audibly into the microphone. But not gonna lie, it is laughable that they say such things.

@Lynn4NYC Someone following this thread actually did also notice this and helpfully replied with @mdc_martinus's tweet from a few weeks ago that I was thinking of. I got the place wrong, it was Massachusetts, not... baltimore... but the point stands

@Lynn4NYC @mdc_martinus If they can do it in the 19th century with some hacked together combination of a bellows and a test tube, why can't we?



Maarten De Cock
@mdc_martinus · **Follow**

Replying to @mdc_martinus

…their 19th century portable CO2 meters: ‘air-testers’ made by the German Professor Wolpert.

If these tests showed insufficient ventilation, the inspector wrote an order and later revisited the school, tested the air again to see whether the ventilation was indeed improved.

METHOD OF ASCERTAINING THE QUANTITY AND QUALITY OF AIR IN INHABITED APARTMENTS.

In making tests of the quality of the air in school-rooms or other inhabited apartments, Professor Wolpert's air tester has been used by the inspectors. While it is not absolutely essential for our purposes to obtain the strictest accuracy in determining the quality of air in any given apartment, yet, in testing the quality of air, this little instrument has been found, when compared with scientific analysis of air, to be practically all that is required for our use.

Gedigitaliseerd door Google

3:59 PM · Sep 7, 2023

210 Reply Copy link

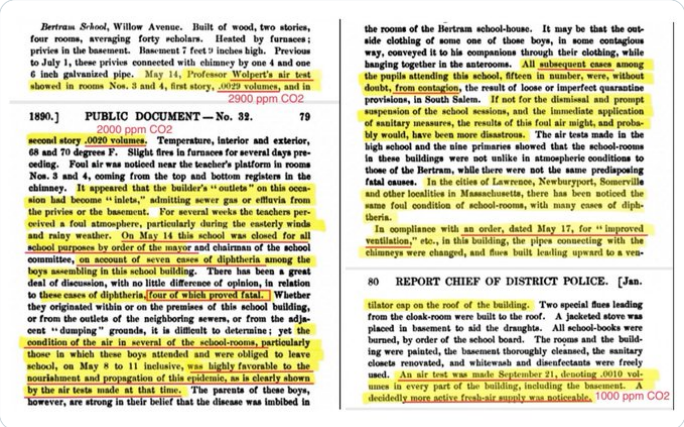
Read 2 replies

@Lynn4NYC @mdc_martinus Apparently, back then, they had the gumption to do whatever was necessary to make the school safe.

Maarten De Cock
@mdc_martinus · **Follow**

Replying to @mdc_martinus

In an annual report, I found how an inspector notes very poor ventilation (2900 ppm CO2) just when there is an outbreak of diptheria, which is airborne. Four boys die from it. The school is temporarily closed and an order for improved ventilation is written and executed.



Bertram School, Willow Avenue. Built of wood, two stories, four rooms, averaging forty scholars. Heated by furnaces; privies in the basement. Basement 7 feet 9 inches high. Previous to July 1, these privies connected with chimney by one 4 and one 6 inch galvanized pipe. May 14, Professor Wolpert's air test showed in rooms Nos. 3 and 4, first story, .0029 volumes, and in 2900 ppm CO2

1890.] PUBLIC DOCUMENT — No. 32. 79

2000 ppm CO2

second story .0020 volumes. Temperature, interior and exterior, 68 and 70 degrees F. Slight fires in furnaces for several days preceding. Foul air was noticed near the teacher's platform in rooms Nos. 3 and 4, coming from the top and bottom registers in the chimney. It appeared that the builder's "outlets" on this occasion had become "inlets," admitting sewer gas or effluvia from the privies or the basement. For several weeks the teachers perceived a foul atmosphere, particularly during the easterly winds and rainy weather. On May 14 this school was closed for all school purposes by order of the mayor and chairman of the school committee, on account of seven cases of diphtheria among the boys assembling in this school building. There has been a great deal of discussion, with no little difference of opinion, in relation to these cases of diphtheria, four of which proved fatal. Whether they originated within or on the premises of this school building, or from the outlets of the neighboring sewers, or from the adjacent "dumping" grounds, it is difficult to determine; yet the condition of the air in several of the school-rooms, particularly those in which these boys attended and were obliged to leave school, on May 8 to 11 inclusive, was highly favorable to the nourishment and propagation of this epidemic, as is clearly shown by the air tests made at that time. The parents of these boys, however, are strong in their belief that the disease was imbibed in the rooms of the Bertram school-house. It may be that the outside clothing of some one of those boys, in some contagious way, conveyed it to his companions through their clothing, while hanging together in the anterooms. All subsequent cases among the pupils attending this school, fifteen in number, were, without doubt, from contagion, the result of loose or imperfect quarantine provisions, in South Salem. If not for the dismissal and prompt suspension of the school sessions, and the immediate application of sanitary measures, the results of this foul air might, and probably would, have been more disastrous. The air tests made in the high school and the nine primaries showed that the school-rooms in these buildings were not unlike in atmospheric conditions to those of the Bertram, while there were not the same predisposing fatal causes. In the cities of Lawrence, Newburyport, Somerville and other localities in Massachusetts, there has been noticed the same foul condition of school-rooms, with many cases of diphtheria.

In compliance with an order, dated May 17, for "improved ventilation," etc., in this building, the pipes connecting with the chimneys were changed, and flues built leading upward to a ven-

80 REPORT CHIEF OF DISTRICT POLICE. [Jan.

tilator cap on the roof of the building. Two special flues leading from the cloak-room were built to the roof. A jacketed stove was placed in basement to aid the draughts. All school-books were burned, by order of the school board. The rooms and the building were painted, the basement thoroughly cleansed, the sanitary closets renovated, and whitewash and disenfectants were freely used. An air test was made September 21, denoting .0010 volumes in every part of the building, including the basement. A decidedly more active fresh-air supply was noticeable. 1000 ppm CO2

3:59 PM · Sep 7, 2023

242 Reply Copy link

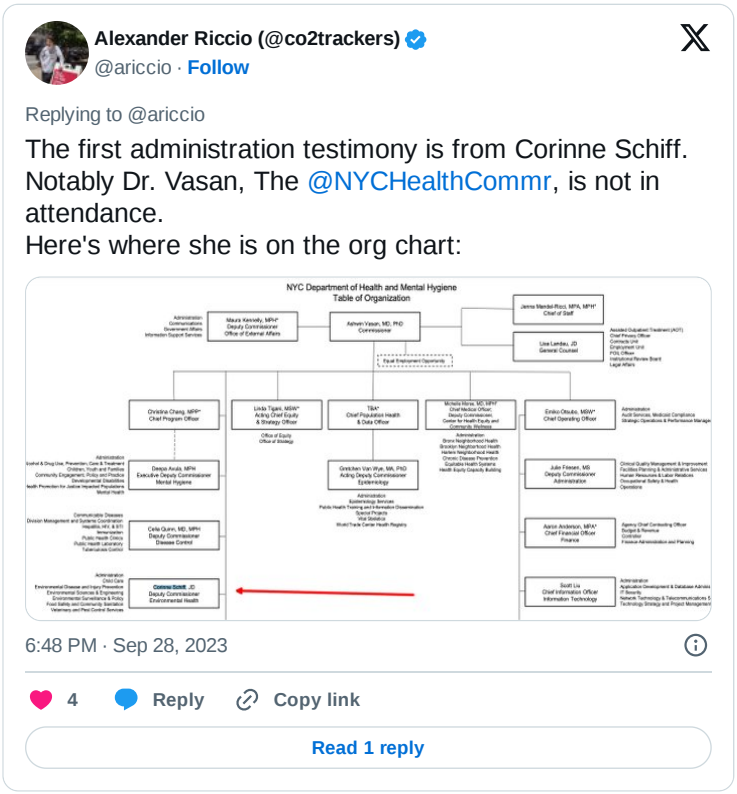
Read 4 replies

@luckytran, @gydaarber, and others, its like 1 am, ill get to you tomorrow

@famulare_mike Dan holohan also has a TON about that 😂

@rattyinexub666 Remember, who they chose to send:

Not her fault.



@rattyinexub666 I've even found some of the papers where he wrote speeches to the mayor because he caused a political ruckus when he once did something that was eminently a good policy, and there was a media frenzy.

It is not my intent for @Lynn4NYC and @KeithPowersNYC to make her look bad. It's not even FULLY her fault that she's in this position.

Her superiors sent her here to testify without the right direction, maybe even explicitly the wrong direction.

The city administration has, as a whole, severely failed to deal with this issue, as has the government at the state, and federal levels. Even supranational bodies like the WHO completely dropped the ball.

The fish rots from the head. And those higher levels of government have abrogated their duty to lead, so it's up to each of us to force action at lower levels of government.

And through no SPECIFIC fault of her own, she happens to be the person in this position at the time when nearly everybody in an official position is screwing this up. She shouldn't bear ALL the blame for her colleagues at the local, state, and federal levels.

That's why I'm glad it's an issue that's finally in the crosshairs of legislators. This issue is finally getting the attention that it deserves, which means it's less likely that any single individual officials will be put in the position of having to answer for ALL their colleagues.

And I would like to be clear to Corrine Schiff.

If you ever end up reading this thread from a random member of the public for some odd reason, I don't actually wish negative attention on you. I don't actually think you're deliberately and/or maliciously

saying things that appear untrue. I suspect you're just unaware of the key and absolutely decisive role that indoor air and indoor air quality monitoring play in the spread and mitigation of infectious disease.

It's just not what your department has been up to for generations. It's just not in the culture of the entire institution of Public Health, and that's what we're all trying to change.

I would prefer it happen this generation though. Not that it wait until my kids kids kids are in school. Sadly, the way these hearings work, there is almost never the opportunity to have several rounds of testimony between different groups of witnesses and members of the public. That would be harder and time consuming, so I absolutely understand, but y'know, if they ever want to change that... I'd love it! Hint hint councilmembers 😉

@AndiH72 @amandalhu If you are thinking about doing it, I beg you to do it! You have only 24 hours! Make sure to mention my name 😉

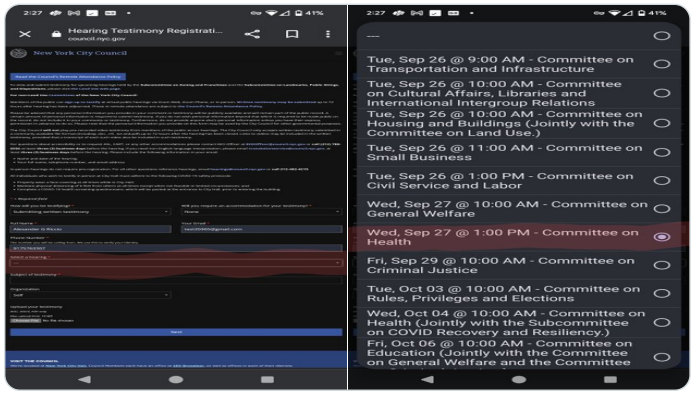
@famulare_mike If there's any chance you might be able to do so, I beg you to submit testimony in the next 24 hours!! Mention my name.
Do so here:

Hearing Testimony Registration
Together, we make the laws governing New York City
https://council.nyc.gov/testify/

@StopHotboxing

Alexander Riccio (@co2trackers)
@ariccio · **Follow**

Oh, and if you're submitting testimony, select the committee on health on the 27th!



6:35 PM · Sep 29, 2023 from Manhattan, NY

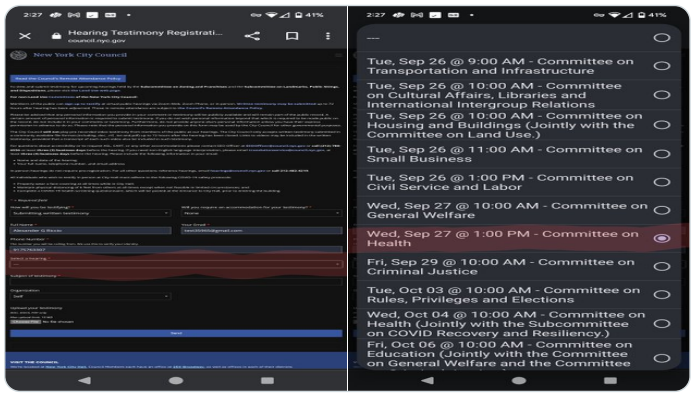
2 Reply Copy link

Read 1 reply

@AndiH72 @amandalhu

Alexander Riccio (@co2trackers)
@ariccio · **Follow**

Oh, and if you're submitting testimony, select the committee on health on the 27th!

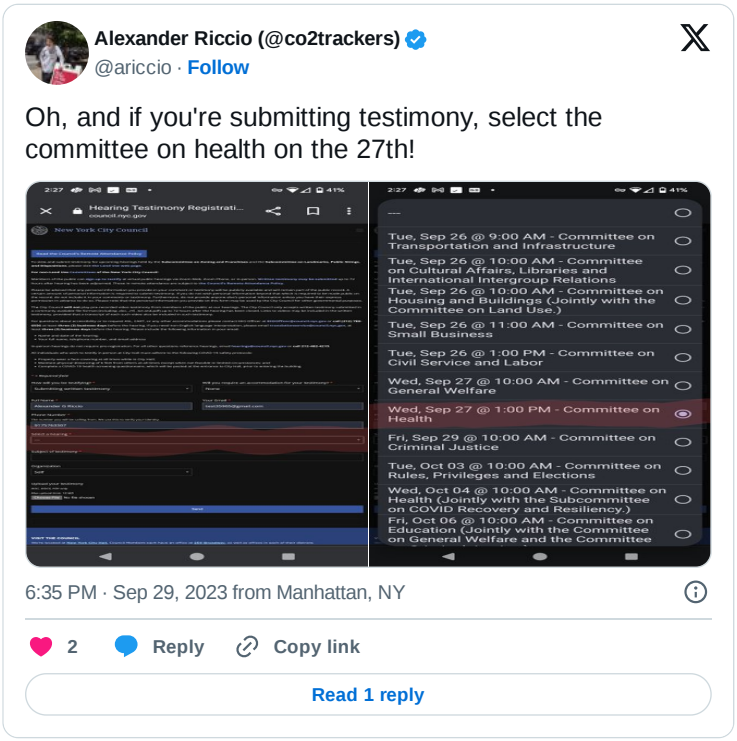


6:35 PM · Sep 29, 2023 from Manhattan, NY

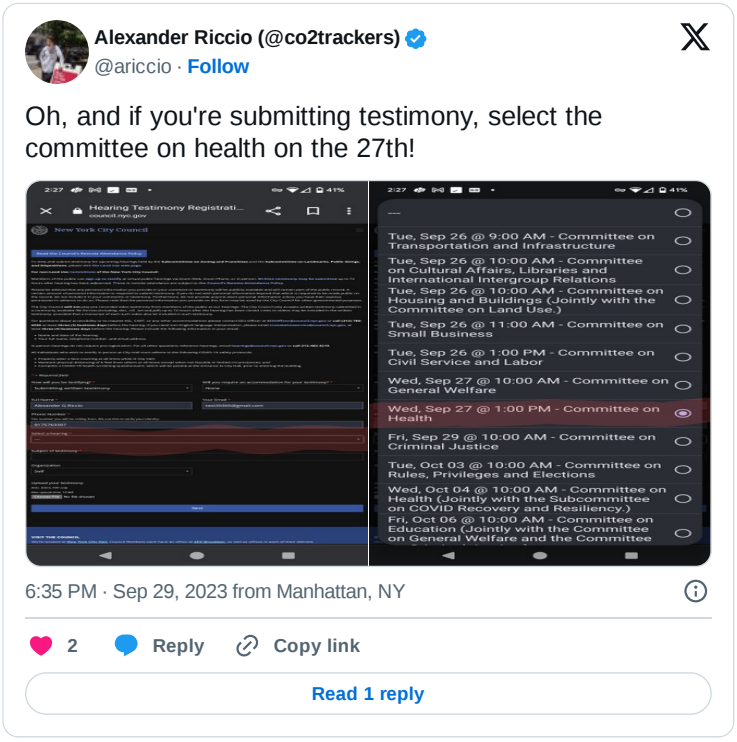
2 Reply Copy link

Read 1 reply

@open_erv



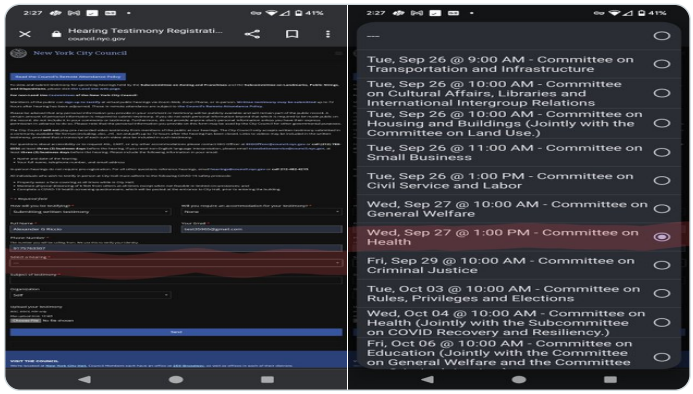
@amandalhu



@slowkow

Alexander Riccio (@co2trackers)
@ariccio · **Follow**

Oh, and if you're submitting testimony, select the committee on health on the 27th!



6:35 PM · Sep 29, 2023 from Manhattan, NY

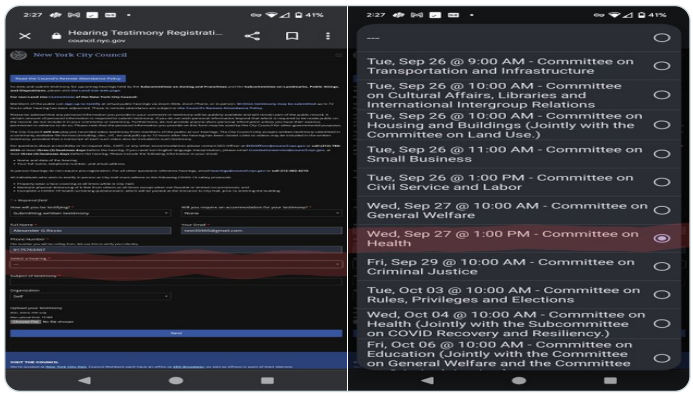
2 Reply Copy link

Read 1 reply

@Shoobydoowoo

Alexander Riccio (@co2trackers)
@ariccio · **Follow**

Oh, and if you're submitting testimony, select the committee on health on the 27th!



6:35 PM · Sep 29, 2023 from Manhattan, NY

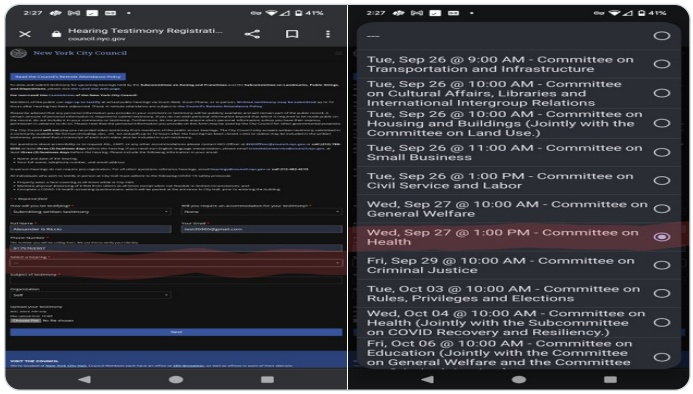
2 Reply Copy link

Read 1 reply

@StopHotboxing

Alexander Riccio (@co2trackers)
@ariccio · **Follow**

Oh, and if you're submitting testimony, select the committee on health on the 27th!



6:35 PM · Sep 29, 2023 from Manhattan, NY

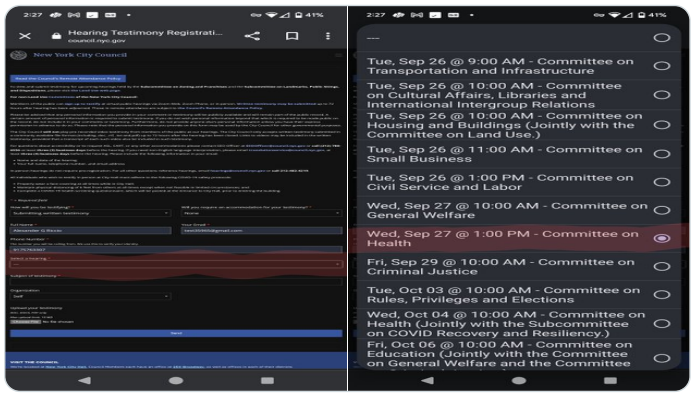
2 Reply Copy link

Read 1 reply

@famulare_mike

Alexander Riccio (@co2trackers)
@ariccio · **Follow**

Oh, and if you're submitting testimony, select the committee on health on the 27th!



6:35 PM · Sep 29, 2023 from Manhattan, NY

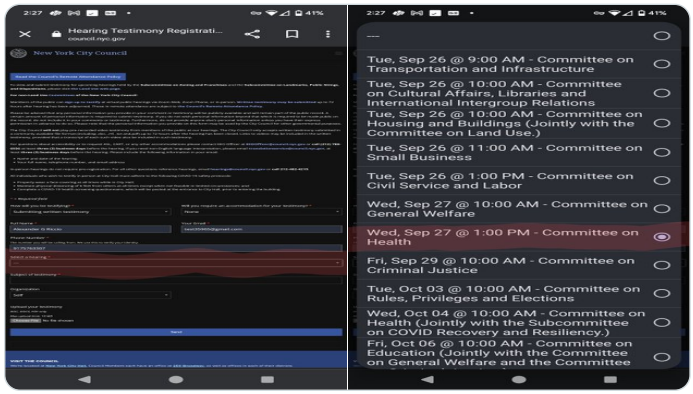
2 Reply Copy link

Read 1 reply

@sharla_cfm

Alexander Riccio (@co2trackers)
@ariccio · **Follow**

Oh, and if you're submitting testimony, select the committee on health on the 27th!



6:35 PM · Sep 29, 2023 from Manhattan, NY

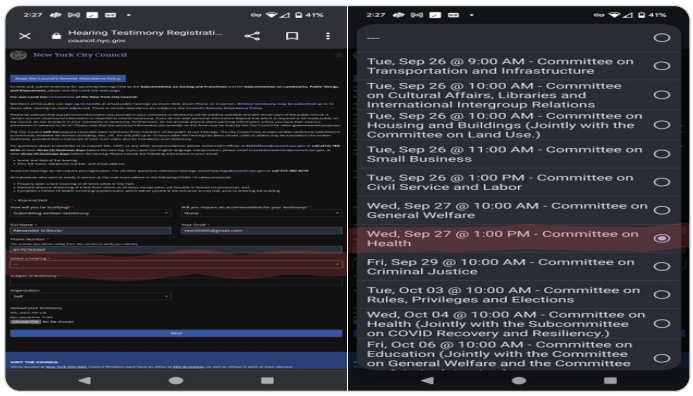
2 Reply Copy link

Read 1 reply

@msun_12 @myrabatchelder

Alexander Riccio (@co2trackers)
@ariccio · **Follow**

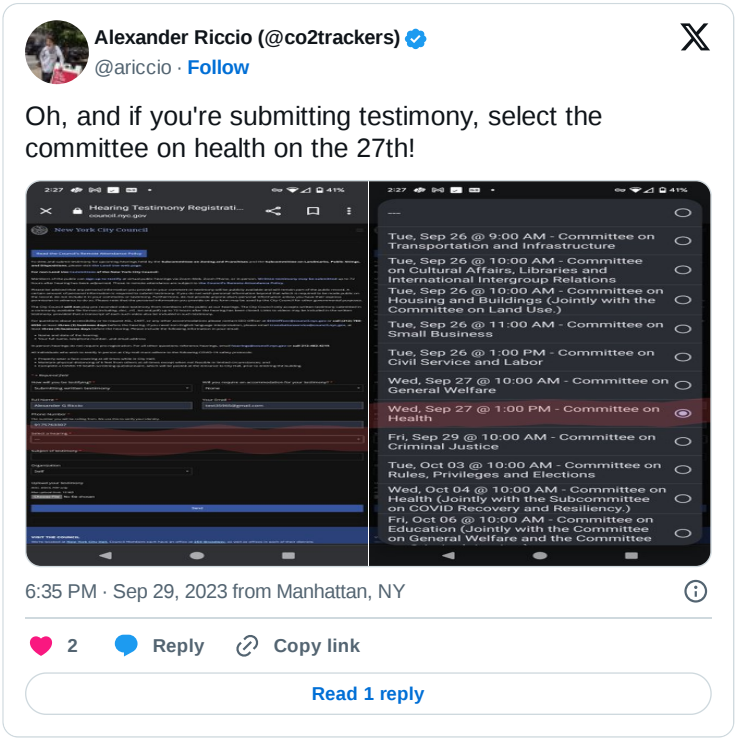
Oh, and if you're submitting testimony, select the committee on health on the 27th!



6:35 PM · Sep 29, 2023 from Manhattan, NY

2 Reply Copy link

Read 1 reply



@winthrop317 @amandalhu Imo the @AranetIoT cloud infra is really good, but I dunno if they make an upgraded aranet with PM and VOC measurements.

@ThePurpleAir is another top notch company, I just don't have any experience with them!

Uggh I definitely pushed myself too much this week (it was worth it) but I don't know if I'll have the energy to specifically type up written testimony - I may just submit this thread 😂

@threadreaderapp

Oh! I was too tired to do it last night, but for the record, one of the volunteers was @grievesmith! Thank you so much for the important contribution.

@grievesmith

@grievesmith

@grievesmith

Being totally serious here: what you're doing is not that different from what I did to learn C! It's the hard way for sure, but sometimes it works very well because you're not trying to "learn C" as much as "do

something specific with the Arduino", and you end up really good because of just... using it as you need it.... instead of in contrived ways!
As a matter of fact, I'll just say this as a bit of a sidenote, the best programmers look things up every time - easier to get it right the first time, than to spend hours debugging!

I make a conscious effort to check docs every time, heck, I even copy some of them over to the code, and try to include links to make it easy to check!
See, for example:

@threadreaderapp

• • •

I am writing with testimony regarding Int. No. 1127, regarding monitoring the air quality in schools. I am a member of Climate Families NYC. My daughter is in third grade and has some minor breathing and lung issues. I try to be careful about air quality (wildfire smoke, etc.), but it is very difficult when she is in school and away from me. I cannot consistently get her to wear a mask, and I don't think that she should have to when she is trying to learn and speak and interact with peers and teachers. Her school is located on a busy avenue with a lot of commercial traffic and large vehicles. I would feel much better having information about the quality of her air while I am not with her, and being able to advocate for improvements in the quality of her air. I am concerned for her and her classmates, some of whom I know also have lung issues. Our children are depending on us to advocate for their health and safety. Children around the world are literally dying from air pollution. Monitoring the quality of air in schools is an important step toward addressing the horrible health issues that we are suffering from in NYC as a result of fossil fuels. I support the passage of Int. No. 1127 and hope that you will take this step for all of our children.

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. _____ Res. No. _____

☐ in favor ☐ in opposition

Date: _____

(PLEASE PRINT)

Name: Alan Watts

Address: 24 Seth Cayea Drive

I represent: CerroZone, LLC

Address: _____

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. 1127, 1128, 1129, 1130 Res. No. _____

☑ in favor ☐ in opposition

Date: 9/27/23

(PLEASE PRINT)

Name: Nina Prescott

Address: St Johns Pl Brooklyn NY 11216

I represent: RMI (formerly Rocky Mountain Institute)

Address: 17 State St New York NY 10004

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. 1127-1130 Res. No. _____

☑ in favor ☐ in opposition

Date: 9/27/23

(PLEASE PRINT)

Name: Lacey Tauber

Address: _____

I represent: Brooklyn Borough President Reynoso

Address: _____

Please complete this card and return to the Sergeant-at-Arms

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. 1127-2023, 1128-2023, 1129-2023, 1130-2023 Res. No. _____

☒ in favor ☐ in opposition

Date: 9/27/2023

(PLEASE PRINT)

Name: Alexander Ricco

Address: East 69th street

I represent: Team airborne, covid co2 Tracker/CO2 Tracker

Address: _____

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. _____ Res. No. _____

☑ in favor ☐ in opposition

Date: 9/27/23

(PLEASE PRINT)

Name: Kate Krause

Address: Dean St

I represent: Rising Tide Effect: water safety coalition

Address: _____

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. 1127-1130 Res. No. _____

☑ in favor ☐ in opposition

Date: 9/27/23

(PLEASE PRINT)

Name: Cara Johnson

Address: _____

I represent: Carrier Corporation

Address: _____

Please complete this card and return to the Sergeant-at-Arms

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. _____ Res. No. _____

☐ in favor ☐ in opposition

Date: 9/18/23

(PLEASE PRINT)

Name: Corinne Schiff

Address: Deputy Commissioner for Environmental Health

I represent: (DOHMH)

Address: _____

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. _____ Res. No. _____

☐ in favor ☐ in opposition

Date: _____

(PLEASE PRINT)

Name: David Cardenas

Address: Executive Director of Mechanical Engineering, Construction and

I represent: Technical Services DCAS

Address: _____

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. _____ Res. No. _____

☐ in favor ☐ in opposition

Date: _____

(PLEASE PRINT)

Name: Joseph Wagner

Address: Assistant Commissioner/Chief

I represent: Engineer, Construction and Technical Services (DCAS)

Address: _____

Please complete this card and return to the Sergeant-at-Arms

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. _____ Res. No. _____

☐ in favor ☐ in opposition

Date: _____

(PLEASE PRINT)

Name: Lana Kim

Address: Deputy Commissioner, facilities Management

I represent: (DCAS)

Address:

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. _____ Res. No. _____

☐ in favor ☐ in opposition

Date: _____

(PLEASE PRINT)

Name: John Shea

Address: Chief Executive Officer of the

I represent: Department of School facilities

Address: (NYC Public Schools)

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. _____ Res. No. _____

☐ in favor ☐ in opposition

Date: _____

(PLEASE PRINT)

Name: Daniel Donovan

Address: Executive Director of Mechanical

I represent: Maintenance and Operations,

Address: facilities Management DCAS

Please complete this card and return to the Sergeant-at-Arms

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. _____ Res. No. _____

☐ in favor ☐ in opposition

Date: _____

(PLEASE PRINT)

Name: Andrew Faciano

Address: Assistant Commissioner of Environmental

I represent: Disease and Injury Protection

Address: (DOHMH)

Please complete this card and return to the Sergeant-at-Arms

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. _____ Res. No. _____

☐ in favor ☐ in opposition

Date: _____

(PLEASE PRINT)

Name: Heather Router

Address: Deputy Commissioner for Planning

I represent: and Resilience (NYCEM)

Address: _____

Please complete this card and return to the Sergeant-at-Arms